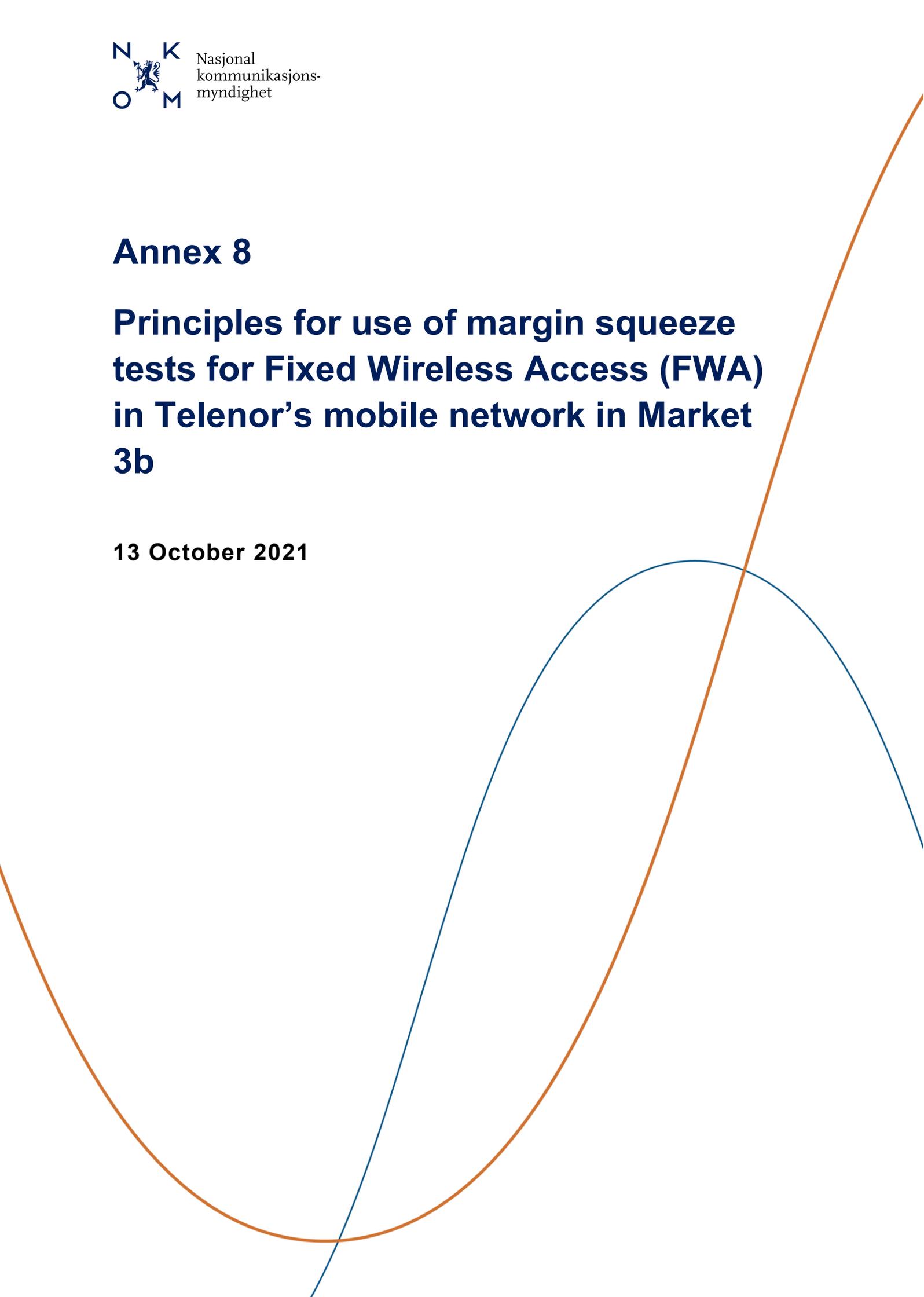


Annex 8

Principles for use of margin squeeze tests for Fixed Wireless Access (FWA) in Telenor's mobile network in Market 3b

13 October 2021



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1 Introduction

Telenor ASA has been designated as a provider with significant market power in the market for wholesale central access provided at a fixed location (Market 3b). Telenor has had an obligation imposed to provide wholesale access to fixed wireless access (FWA) in Market 3b. This access obligation is supported by price controls in the form of a prohibition against subjecting buyers of access to a margin squeeze. In this annex, Nkom specifies the underlying principles for the use of margin squeeze tests that will be used as a tool for price regulation of wholesale access to FWA in Telenor's mobile network in Market 3b.

The model for margin squeeze tests for FWA is developed with the European Commission's Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (the Recommendation)¹ and BEREC's Guidance on the regulatory accounting approach to the economic replicability test (i.e. ex-ante / sector-specific margin squeeze tests, applied for NGA products, 5 December 2014)² as a starting point.

The margin squeeze test calculates the margin of an efficient alternative provider that buys FWA wholesaler access from Telenor and offers a portfolio consisting of Telenor's commercially most attractive retail products (flagship products). This means that a margin is estimated for the efficient alternative provider by calculating the retail revenues and associated costs of providing the retail products included in the portfolio. The overall objective of the margin squeeze test is to ensure that buyers of FWA wholesale access in Market 3b can achieve a reasonable margin by replicating the portfolio of flagships products.

2 Definition of margin squeeze³

BEREC says the following about a margin squeeze situation:

"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."⁴

A margin squeeze exists if competitors that buy access from the vertically integrated provider with significant market power (the SMP provider) cannot offer the same retail prices as the SMP provider and at the same time make a profit.

¹ See the European Commission (2013).

² See BEREC (2014).

³ See also WIK for ILR (2013).

⁴ See ERG (2009), page 2. (ERG has now been replaced by BEREC).

The margin squeeze test is passed if the retail revenues are equal to or higher than the total of the wholesale costs and the downstream costs, including return on invested capital.

Where there are complex price structures in the retail and wholesale markets, the relevant items may consist of a combination of product-related revenues and costs.

A margin squeeze test is passed if:

$$\text{Retail revenues} \geq \text{Wholesale costs} + \text{Downstream costs}$$

Downstream costs include own network costs, retail costs and other costs (regulatory costs, etc.).

3 Main principles for designing a margin squeeze test

3.1 Efficiency levels and scale adjustments

A margin squeeze test includes a methodical choice of the level of efficiency of the efficient alternative provider modelled in the margin squeeze test. A distinction is often made between the following three different approaches:

- In an Equally Efficient Operator (EEO) approach, the test assumes that the efficient alternative provider has the same scale and efficiency as the SMP provider. The data set of the SMP provider will thus be used as the starting point for the test.
- In a Reasonably Efficient Operator (REO) approach, the test uses the scale and efficiency of an efficient alternative provider and will thus use the data set for efficient alternative providers.
- An Adjusted Equally Efficient Operator (adjusted EEO) approach involves that the test assumes an EEO approach as a starting point, but allows for adjustment of the SMP provider's data. The adjustments will be associated with specific costs that occur only for access buyers and adjustments for efficiency in areas where an efficient alternative provider cannot be expected to achieve the equivalent economies of scope and economies of scale as an SMP provider.

According to the Recommendation, a lack of economic replicability can be illustrated by showing that the SMP provider's own retail operations cannot operate profitably on the basis of the wholesale prices that the SMP provider demands from its rivals. The Recommendation's starting point is that an EEO approach should be used in margin squeeze tests.

In terms of the further contents of margin squeeze tests, article 56 of the Recommendation states a minimum number of parameters that must be set. The parameters are described in

more detail in the guide in annex II to the Recommendation. The annex assumes that the downstream costs will be calculated on the basis of the cost of the SMP provider's own downstream operations (EEO approach). It should be noted, however, that national regulatory authorities can make scale adjustments to the SMP provider's downstream costs to ensure that economic replicability is realistic. The Recommendation refers to two situations in which deviation from a pure EEO approach is justified:

1. When market entry or growth have previously been prevented.
2. When there are indications that alternative providers do not have the incentives to increase their size due to objective financial circumstances, as illustrated by a low number of accesses and limited geographical distribution compared with the SMP provider's NGA network.

Significant entry barriers exist with regard to establishing an FWA service based on own infrastructure. The costs associated with establishing a nationwide mobile network capable of providing FWA are very high. It is not reasonable to expect the establishment of additional nationwide mobile networks within the current and upcoming regulatory period. Similarly, there will also be entry barriers related to access to nationwide frequency resources.

It is reasonable to assume that Telenor has economies of scope and economies of scale in the retail market for standardised broadband access that competitors cannot replicate. This means that Telenor is capable to offer and distribute retail services more efficiently than its competitors.

Telenor uses its established production, sales and marketing resources to offer FWA as a broadband product to end users who will not be offered fibre access when the copper network is shut down. The economies of scope and economies of scale thus also apply to the FWA product, in the same way as for the overall retail market for standardised broadband access. For the margin squeeze test for FWA to serve its purpose, Nkom therefore believes it is necessary to take into account the fact that Telenor has greater economies of scope and economies of scale than its competitors. These considerations apply to competing broadband providers, as well as mobile telephony providers also wishing to offer FWA.

Many of the broadband suppliers are regionally anchored providers for which FWA can be an additional product in order to serve their geographical market area. Access to local frequency resources may be possible. For many of the alternative providers, there will thus be a limited geographical area for provision of FWA.

Against the background of the conditions described above, Nkom believes that, based on Norwegian conditions, it can be assumed that deviations from a pure EEO approach are justified.

On this basis, Nkom concludes that the margin squeeze test should be based on an adjusted EEO approach. This means that the margin squeeze test will be based on data from Telenor. In cases where it is necessary to make adjustments to Telenor's data set, this will be done in

accordance with Sections 3.1.1 and 3.1.2. Adjustments may include items where alternative providers will not be able to achieve similar economies of scope and economies of scale as Telenor. The test will also include specific costs that only arise for alternative providers in their role as buyers of access.

3.1.1 Relevant market share

The adjusted EEO principle presupposes that the size, measured in market share, of the efficient alternative operator is taken into account.

In the market analysis of Market 3b, Nkom concluded that the geographical market is national. In order for the margin squeeze test to be consistent with the market definition, Nkom believes that the geographical market used to determine the market share of the efficient alternative provider must also be based on the assumption that the market is national.

In practice, a national geographical market will in this context mean the geographical area where the required services for wholesale FWA access are available in Telenor's mobile network.

Nkom has assessed which market share should be applied to the margin squeeze model for FWA, as well as how the market share should be calculated.

With regard to the calculation basis, Nkom has assessed whether it is most appropriate to assume a market share based on actual FWA customers in Telenor's network ("homes connected"), or the number of potential/available FWA customers that Telenor defines at any time as relevant for FWA offers ("homes passed"). Nkom assumes that Telenor's address list of potential/available FWA customers is dynamic, and that it can be changed on the basis of ongoing assessments of, among other things, the competitive situation, customer needs and cost differences between fibre development and FWA provision in different geographical areas. Nkom therefore believes that it will give greater predictability in the margin squeeze assessments if a market share for the efficient alternative provider is assumed that is based on the actual number of FWA customers in Telenor's network during the period for which the margin squeeze test is performed.

Since FWA is a fairly new product in both the retail and wholesale markets, and there are no international reference figures to show the market shares that can be achieved by an efficient alternative FWA provider, based on wholesale access, Nkom has based its determination of market share in the FWA margin squeeze model on an overall assessment of various factors.

The first 65,000 - 70,000 FWA customers in Telenor's network did not have to buy an outdoor antenna as part of establishing the FWA connection. According to Telenor, a large proportion of these customers have not installed an outdoor antenna and have thus paid a lower establishment price than FWA customers with outdoor antennas. The requirement for outdoor antennas was introduced by Telenor in November/December 2020, both in the retail and wholesale markets. This entails that for many of the existing FWA customers in Telenor's

network, a switching cost will accrue corresponding to the price for establishing an outdoor antenna if the end-customer is to switch FWA provider from Telenor to an access seeker. In Nkom's assessment, this can make it difficult for access seekers to make attractive, competitive FWA offers to these existing FWA customers in Telenor's network. This indicates that in the margin squeeze model for FWA a rather lower market share for an efficient alternative provider should be assumed than if Telenor had not introduced an outdoor antenna requirement after the first 65,000 - 70,000 FWA connections.

Telenor has furthermore stated that end-customers wishing to switch FWA provider cannot use the same outdoor antenna as was installed by the first provider, as the service will not function without a new antenna from the provider to which the end-customer switches. In Nkom's assessment, this will represent a not insignificant barrier to switching in the FWA retail market. Since Telenor has a relatively large existing base of FWA customers before any access seekers have really started their FWA activities, this is a factor that can lead to an efficient alternative provider's market share being lower than if the end-customer could reuse an outdoor antenna already installed on switching FWA provider.

It is difficult to estimate the development in the number of FWA customers in Telenor's network in the coming years. As part of the decommissioning of the copper network, the remaining copper customers will be offered either fibre or FWA from Telenor. Several of the copper customers may also be offered fibre or FWA connections based on other broadband providers' networks. Moreover, it remains to be seen to what extent existing fibre and HFC customers will switch to FWA solutions. Despite uncertainty related to the distribution between Telenor's fibre and FWA provision to the remaining copper customers, as well as how competing fibre and FWA provision will affect the development in the number of FWA customers in Telenor's network over the next few years, Nkom believes there is reason to assume that Telenor's existing customer base will account for a significant share of the total number of FWA customers in Telenor's network in two-three years' time. This entails that the aforementioned switching costs for existing FWA customers in Telenor's network should be taken into account on determining the market share for an efficient alternative.

In the summer of 2021, Nkom notified that Telenor would be required to establish a regime for the reuse of antennas for FWA provision. The intention behind this notified order is to facilitate more real competition for the existing FWA customers in Telenor's network by reducing switching costs. This would affect access seekers' customer growth and market share. However, it is currently uncertain what effect any such regime for reusing antennas would have on an efficient access seeker's ability to achieve an increased market share. It will also take some time for any such a new regime for the reuse of antennas to be in place.

On the basis of the aforementioned and the current market situation for FWA in Norway, in the FWA margin squeeze model, Nkom assumes that the efficient alternative provider has a market share of 15% of actual FWA customers in Telenor's network.

3.1.2 Conducting margin squeeze tests and relevant scale adjustments

To ensure that price controls are effective in the sense that buyers of FWA wholesale products in Market 3b can replicate a portfolio corresponding to Telenor's retail products, Nkom believes that as a general rule, it will be necessary to carry out margin squeeze tests twice a year. The tests will normally be conducted in May and November. Nkom may also carry out margin squeeze tests on its own initiative where appropriate; for example, if new FWA wholesale products are introduced in Market 3b. The first margin squeeze test for FWA will be carried out as soon as possible after a decision on margin squeeze regulation for FWA has been adopted by Nkom.

Nkom will collect data from Telenor in connection with each margin squeeze test conducted. Data will be collected on the number of subscriptions that Telenor has for its FWA-based broadband products and the retail prices. Collection of retail prices is necessary to ensure that the margin squeeze test uses correct retail prices. Nkom may ask Telenor to confirm and, as applicable, update its list of retail prices at the time the test is going to be performed. Nkom will send Telenor a data collection form approximately two months before the margin squeeze test is going to be carried out. This form will normally be sent to Telenor in March and September.

At the second normal conduction of the margin squeeze test, i.e. in November, Nkom will in addition update all the relevant cost data in the margin squeeze test. In order to carry out this kind of update, Nkom will collect data from Telenor, based on the regulatory cost accounts that Telenor must submit by 1 July every year. The updated data will be used until Nkom receives new cost data the following year.

Nkom will send a data collection form to the alternative providers in September. The providers will have approximately two months to report the requested data. The purpose of this data collection is to obtain a basis for assessing whether it is necessary to make adjustments to the data reported from Telenor.

Nkom will review and ensure the quality of the reported data. Telenor's data will form the starting point for running the margin squeeze test. The data from alternative providers will be used to assess whether alternative providers have similar economies of scope and economies of scale as Telenor. In the assessment of whether Telenor's data sets need adjusting, Nkom will compare the average of the relevant alternative providers' data for a given cost component with Telenor's data. If the comparison shows a deviation compared with Telenor's reported data of 10% or more, Nkom will regard this as an adequate indication that the relevant alternative providers do not have similar economies of scope and economies of scale as Telenor. For these kinds of items, Nkom will adjust Telenor's data set in accordance with the procedure outlined below for the relevant item in subsequent margin squeeze tests.

In cases where it is necessary to make changes to Telenor's data, Nkom will make the adjustment using a weighted average calculation based on Telenor's data and the average of the relevant alternative providers' data. When calculating the adjustment, Telenor's data will be

weighted 30%, while the average of the relevant alternative providers' data will be weighted 70%. Furthermore, Nkom will determine the percentage Telenor's data will be adjusted in the subsequent margin squeeze tests, based on the difference between Telenor's data and the weighted average.

In connection with the margin squeeze test carried out in November, Nkom will determine which items and at what level Nkom finds there are grounds to adjust Telenor's data set. Nkom will use these adjustments until Nkom performs another corresponding assessment. The adjustments will thus normally apply for a period of one year. The adjustments come into effect from the margin squeeze test following the test where the need for adjustment was identified. This means that the adjustments are generally used for the first time in the margin squeeze test normally carried out in May.

For the sake of clarity, Nkom would point out that the margin squeeze test carried out in May will use the same cost data that Telenor submitted in its reporting of cost data for the previous year, cf. above. This means that the cost data will be the same as in the test in the previous November. In accordance with what is stated above about the data collection form for Telenor, the test will be based on an updated assessment of retail products and the retail prices.

In connection with the first margin squeeze test for FWA wholesale products, Nkom will use Telenor's data, with possible adjustments of certain cost items based on data from relevant alternative providers.

In Nkom's opinion, the described method ensures that the margin squeeze tests are conducted in an efficient and predictable manner for both Telenor and access buyers.

Principle 1

Nkom will use an adjusted equally efficient operator (EEO) approach.

The geographical area for the margin squeeze test is the whole of Norway. In practice, this means the area where FWA is offered in Telenor's mobile network.

Nkom will use a modelled alternative provider with a market share of 15% of the available FWA accesses connected to Telenor's mobile network at any time.

As a general rule, Nkom will carry out margin squeeze tests twice a year, in September and March. Nkom may carry out additional margin squeeze tests whenever necessary.

As a starting point, Telenor's data will be used in the margin squeeze tests. For cost items where the discrepancy between Telenor's data and the relevant alternative providers' data is more than 10%, Nkom will adjust Telenor's data set. The test will include costs that are specific for access buyers. In cases where data from Telenor is lacking, market data may be used.

In connection with the margin squeeze tests carried out in November, Nkom will inform the providers about which items there are grounds to adjust and the size of the adjustment as a percentage. The adjustments will apply until Nkom has made an updated assessment of the need for adjustment. The adjustment will normally last for one year.

3.2 Business model

When working out the specifics of the margin squeeze test, it is first necessary to define the business models used in the margin squeeze test. In this context, business models are defined as the possible combinations of relevant retail and wholesale services.

3.2.1 Relevant wholesale products

In the Recommendation, the Commission specifies that national regulatory authorities should identify the most relevant regulated wholesale products based on NGA. Nkom finds it appropriate to use FWA wholesale products Telenor is required to grant access to in Market 3b in the margin squeeze model.

3.2.2 Relevant retail products

The relevant retail products in the margin squeeze test are the FWA retail products offered by Telenor. Today's retail offering from Telenor solely includes internet access at various different speeds. If monthly consumption exceeds fixed data volumes, the speed decreases. Telenor distinguishes between FWA products for the private segment and FWA products for businesses. The margin squeeze test includes standardised private and business products that provide internet access based on FWA in Market 3b.

If Telenor launches a TV product, based on FWA, Nkom will make a concrete assessment of whether and possibly how this TV product should be taken into account in the FWA margin squeeze model. Any such assessment will be subject to consultation in accordance with normal practice before Nkom makes any decision on changing this margin squeeze principle.

Principle 2

Nkom will in the margin squeeze model use the FWA wholesale products Telenor is required to grant access to in Market 3b as the relevant wholesale products.

Standardised residential and business products that providing Internet access based on FWA in Market 3b will be included in the margin squeeze test.

3.3 Retail products included in the margin squeeze test

The Recommendation states that the most commercially attractive products (flagship products) should be included in the margin squeeze test. Flagship products are defined as those retail products that have the highest relevance in terms of revenues, subscribers, and advertising expenses.⁵

Due to a limited number of existing FWA retail products, as well as uncertainty concerning the relative sales development between these products going forward, Nkom deems it most appropriate to include all of Telenor's retail products in both the private and business segments in the FWA margin squeeze tests. Nkom considers that an efficient alternative provider caters for both the private and business segments, and the inclusion of all retail products ensures that both segments are considered in the test.

As a general rule, the margin squeeze test will include all FWA products supplied by Telenor in the retail market. If some products are no longer sold, but are still delivered to existing subscribers, Nkom will assess whether some or all these products should be excluded from the test. In this assessment, Nkom will give weight to how the test must give the best possible picture of the competitive situation in the retail market at the time of the test.

Principle 3

The margin squeeze test for FWA will be carried out for all of Telenor's retail products in the private and business segments.

If some products are no longer sold, but are still delivered to existing subscribers, Nkom will assess whether some or all these products should be excluded from the test.

⁵ The concept of using margin squeeze tests for flagship products was originally proposed by the European Commission (2013) in connection with wholesale pricing for NGA.

3.4 Aggregation level

The aggregation level determines whether a margin squeeze test will be conducted for each retail product individually or for a portfolio of products. The Recommendation does not specify what aggregation level the test should be conducted on. BEREC (2014) finds that each national regulatory authority should decide the correct aggregation level in connection with the margin squeeze test in the context of identified competition problems in the market analysis.

If each retail product is to be tested, no individual products will be able to have a negative margin. By contrast, a portfolio test will use the combined margin for the portfolio of products being assessed. Using this kind of approach, some products could have a negative margin, as long as other products have a positive margin. Therefore, a portfolio test is less strict than a test of individual retail products and allows the SMP provider greater flexibility in its pricing, compared with testing of individual products. A portfolio approach will therefore strengthen the regulated provider's incentives to invest.

The Norwegian broadband market is characterised by the fact that both Telenor and alternative providers mainly offer a broad portfolio of retail services.

In light of this, Nkom will use a portfolio approach in the margin squeeze test. The portfolio approach means that all retail products will be tested as a combined group (portfolio). As regards subscription distribution, Nkom finds that this should be set using Telenor's actual subscription distribution as a starting point, and that the retail products are given a relative weight that corresponds to the distribution of Telenor's customer base.

Principle 4

Nkom will use a portfolio approach in the FWA margin squeeze test. The portfolio approach means that all retail products will be tested as a combined group (portfolio). The subscription distribution is determined on the basis of Telenor's actual subscription distribution. The individual retail products are given a relative weight that corresponds to Telenor's customer base.

3.5 Calculation of relevant revenue

All price elements, recurring and non-recurring, for Telenor's retail products are included in the basis for the relevant revenues. Nkom will apply current prices at the time of the test. Non-recurring price elements (such as connection fees, for example) are normally distributed over a period corresponding to the average customer lifetime.

If the retail prices (listing rates) are discounted permanently or reduced temporarily in the form of promotions, such discounts will be taken into account for the current time period in the calculation of annualised, monthly revenues. The same rule also applies to promotions where individual price elements (for example, connection fees) are not charged or certain types of

goods or equipment (for example, routers and antennas) are provided free of charge. Discounts and promotions will be included in the margin squeeze test as a reduction in income. The monthly average discounts are calculated on the basis of the actual discounts and promotions that Telenor's customers have received in the last 12 months.

If one-off price elements (e.g. connection fees) have been discounted more or less permanently over a longer period of time, but the size of the discount has varied within the relevant time period, Nkom will make a discretionary assessment of which discount level best reflects the current discount on the one-off price element at the time of testing. As part of any such discretionary assessment, Nkom will, among other things, consider whether the historical development in the size of the discount appears to follow a trend, or whether it is more natural to assume an average calculation of discounts in the period in question, when the current price at the time of the test is to be determined in the margin squeeze model.

Principle 5

All the price elements, including recurring and non-recurring price elements, for Telenor's retail products are counted as relevant revenue.

If the retail prices (listing rates) are discounted permanently or reduced temporarily in the form of promotions, these discounts and promotions will be taken into account for the relevant time period in the calculation of the annualised, monthly revenues.

When determining the relevant income, Nkom may use further information provided by alternative providers or market data to complement the data provided by Telenor.

3.6 Relevant time period and test method

A margin squeeze test must be performed for a reasonable period of time. The test can be performed period by period or for multiple periods together. Period by period testing may use the financial year as the basis for analysis. This kind of approach compares revenues and costs as they arise for this period. This means that non-recurring costs and revenues will be included in the margin squeeze calculation for the year of payment or receipt, regardless of whether they are financially relevant to several periods.

In tests covering multiple periods, such as an approach focusing on discounted cash flows or a steady state, the test is performed once for the period in question. The test then requires that the costs and revenues generate a positive margin throughout the entire period being assessed.

According to the Recommendation, national regulatory authorities should consider the profitability of the flagship products on the basis of a dynamic multi-period analysis. Using a discounted cash flow approach, the cash flows for the retail products being assessed will be

discounted.⁶ The outcome of this approach is the net present value of the expected future cash flows for the service or product being tested. If the net present value is positive, delivery of the service or product generates value for the provider, whereas if the net present value is negative, delivery of the service results in a loss and a margin squeeze occurs. The relevant time period for this test is usually set in accordance with the estimated average customer lifetime. However, it is also possible to use a relatively long period that encompasses the entire product lifetime, or even multiple investment cycles.

In a steady state approach, costs and revenues are also broken down to a single time period. Costs and revenues are nevertheless allocated according to cost causation. This means that the investment costs are allocated according to their useful economic life. Where appropriate, non-recurring costs and revenues will also be allocated in accordance with the economic cost causation for the relevant time period, e.g. average customer lifetime or asset lifetime. Depending on the distribution, these amounts are first discounted to calculate the current value, and then distributed evenly over the lifetime using the annuity formula.

In a period by period approach, the margin squeeze test might reveal a margin squeeze in one period, and not in the next, even though nothing has changed in terms of costs, wholesale or retail prices, and distribution of customers. This will be related to a skewed distribution of non-recurring time costs and revenues over time.

Both a steady state approach and a discounted cash flow approach avoid this kind of accounting skew. This is especially important if large initial investments are required. By contrast, a discounted cash flow approach requires an estimation of the relevant parameters over a relatively long period of time.⁷

Nkom finds that a steady state approach is the most suitable approach in margin squeeze tests in Norway, because it provides information on margin squeeze for each individual period. At the same time, costs and revenues are properly allocated over time and discounted where appropriate. A steady state approach is very transparent and practical. A periodic margin squeeze test based on a steady state approach can also take market developments into account, as it provides Nkom with the opportunity to adjust subscription numbers, price changes, etc. in line with real market data instead of uncertain forecasts.

⁶ For a comparison of the advantages and disadvantages of a discounted cash flow approach and period by period approach, see ERG (2009), page 14f.

⁷ See ERG (2009), page 15.

Principle 6

Nkom bases its margin squeeze tests on a steady state approach. Nkom finds this approach best suited since it provides information about margin squeeze for each individual period. At the same time, costs and revenues are allocated over time and discounted where appropriate. Furthermore, the method allows Nkom to adjust subscription numbers, price changes, etc. in accordance with real market data instead of uncertain forecasts.

3.7 Reference time frame

According to the Recommendation, the national regulatory authorities should identify an appropriate reference time frame for the margin squeeze test. The Recommendation states that an appropriate reference time frame is the period in which the end users contribute to covering two types of downstream costs, specifically:

- Downstream costs that are annualised according to a depreciation method and a useful economic life that is appropriate for the assets in question.
- Other downstream costs that are not normally annualised (typically sales and acquisition costs) and that the provider incurs to acquire customers and that should also be covered during the average customer lifetime.

Nkom understands the Recommendation to mean that the margin squeeze test must be designed such that it ensures that both costs that are annualised and costs that are not normally annualised are covered within the chosen reference time frame. In Nkom's opinion, the Recommendation does not provide specific guidelines on how categories of downstream costs are to be allocated when designing the margin squeeze test.

When carrying out a margin squeeze test based on a steady state approach, Nkom believes that it will be appropriate to annualise certain non-recurring costs, and that the average customer lifetime will be an appropriate reference time frame.

The recommendation does not provide guidelines for how the average lifetime should be calculated, and since FWA is a relatively new product, there are no relevant historical figures from either the Norwegian market or internationally. Nkom has obtained estimated customer lifetime data for FWA from both Telenor and alternative providers, and the estimates do not give an unambiguous picture of expected lifetime. Nkom has therefore made its own assessment of customer lifetime for FWA based on various factors that may affect expected customer lifetime in different directions.

Telenor currently mainly offers FWA as a replacement product for copper access to retail customers that are not offered fixed broadband via fibre or HFC networks. If it emerges, going forward, that few new fibre access networks are established in areas where FWA is already

offered, this will point towards a longer customer lifetime for FWA. High customer satisfaction among FWA customers, contributing to limiting the need for fibre expansion in areas with FWA provision, could point in the same direction. If it turns out, however, that further fibre expansion leads to retail customers in several areas with FWA provision also being offered fibre access during the next few years, and FWA customers to a great extent preferring fibre access to FWA, this could lead to a shorter average customer lifetime for FWA.

It is furthermore difficult to say for certain how the competition between the mobile operators' FWA offers and FWA offers from access seekers in the mobile operators' networks will affect the average customer lifetime for FWA in the years ahead. Nkom's notified order to establish a regime for reusing antennas on switching FWA provider could, for example, reduce the switching barriers for FWA customers. This might result in a shorter customer lifetime than if FWA customers cannot reuse the previously installed antenna on switching FWA provider.

In the absence of historical data for average customer lifetime for FWA retail services, based on an assessment of the aforementioned elements, Nkom has chosen to assume a customer lifetime of 60 months, which also corresponds to the customer lifetime in Nkom's margin squeeze model for fibre access.

Nkom will be able to determine a different average customer lifetime if it should turn out that historical figures, or other relevant information, provide a basis for changing the average customer lifetime for FWA in the margin squeeze model. In such case, Nkom will inform Telenor and alternative access seekers accordingly.

Principle 7

Nkom regards average customer lifetime as an appropriate reference time frame for the margin squeeze test.

The margin squeeze test will basically assume an average customer lifetime for FWA for 60 months. Nkom will be able to determine a different average customer lifetime if it should turn out that historical figures, or other relevant information, provide a basis for changing the average customer lifetime for FWA in the margin squeeze model.

3.8 Relevant cost standard

The Recommendation suggests LRIC+ as the relevant cost standard.⁸ This cost standard ensures that providers have all their incurred costs covered. LRIC+ is the change in total costs as a result of the production of an increment in the quantity of output plus a mark-up for the common costs and administrative costs for the service in question.

⁸ This is also in line with the BEREC Recommendation (2013), page 34.

The LRIC+ standard is consistent with market entry decisions that require that all relevant costs are covered in the long term and can be calculated using bottom-up or top-down data.

In the margin squeeze model, Nkom will assume that all relevant costs are to be covered in the long term. The model will thus contain both variable and fixed costs. Nkom will collect cost information from Telenor and relevant alternative providers. In the model, fixed costs will be distributed over the corresponding lifetime.

Principle 8

In the margin squeeze model, Nkom will assume that all relevant costs are to be covered. The model will contain both variable and fixed costs. Fixed costs will be distributed over the corresponding lifetime.

3.9 Reasonable return on invested capital

The Recommendation does not set guidelines for reasonable return on invested capital, but it does specify a requirement that an efficient alternative operator that buys access ought to be able to economically replicate the SMP provider in the retail market.

The relevant return or margin in a margin squeeze context is usually identified indirectly using an approach with the weighted average capital cost (WACC) of the downstream operations. WACC represents the opportunity cost of capital invested in the business, and thus the return on the investment required to compensate for this opportunity cost. The margin between the retail revenues and the wholesale costs should be large enough that an efficient alternative provider can achieve an adequate return on invested capital.

Nkom has assessed whether WACC for fixed networks or WACC for mobile networks should be used in the margin squeeze test for FWA. This is a product that is part of the retail market for standardised broadband access and is defined as a Market 3b product at wholesale level. This indicates that WACC for fixed networks should be used. Even though the FWA wholesale product is mainly produced in mobile networks, this wholesale product is used by access seekers to migrate existing copper customers and/or compete for new broadband customers in the retail market for fixed broadband access. This is also an element conducive to the use of WACC for fixed networks. The same applies to the principle of technology-neutral regulation in the broadband market, which indicates the use of WACC for fixed FWA networks, in the same way as for copper and fibre.

On this basis, Nkom will assume a WACC in the margin squeeze model based on Nkom's decision regarding the WACC for fixed networks at any time.

Principle 9

An efficient alternative provider ought to be able to achieve a reasonable return on invested capital. Nkom will assume a WACC in the margin squeeze model based on Nkom's decision regarding the WACC for fixed networks at any time.

3.10 Relevant downstream costs

Downstream costs for FWA can be divided into five overall cost categories:

1. Own network costs
2. Retail costs
3. Other costs related to FWA (regulatory costs, etc.)
4. Other common costs

A more detailed description of cost components within each of these four overall cost categories is listed below. This list is not necessarily exhaustive, but forms the basis for obtaining cost data from Telenor and relevant alternative FWA providers.

In the margin squeeze model, a distinction is made between fixed one-off costs/investments to offer FWA in the retail market, monthly fixed costs irrespective of customer volume, and variable costs per customer or per new customer. If, for any of the cost components, there turns out to be a different distribution/weighting between fixed one-off costs/investments, fixed ongoing monthly costs and variable costs, in the cost data collected from Telenor and relevant alternative providers, on the basis of the cost data obtained, Nkom will be able to make discretionary assessments of the data basis, so that it is possible to compare the cost data from the various players and determine whether the average of the relevant alternative providers' data for a given cost component shows a deviation of 10% or more from Telenor's reported cost data, see principle 1.

(1) Own network costs

An efficient alternative provider's own network costs related to FWA are broken down into the following cost components:

- Core network
- Service platform
- IP transit and peering
- Customer premises equipment, including installation (CPE)

Network elements are dimensioned to represent the selected market share for the efficient alternative provider. In addition, an efficient network structure is assumed. Network equipment is depreciated according to the relevant useful economic life for the asset.

(2) Retail costs

The following cost elements are used for the modelling of an efficient alternative operator's retail costs:

- Product development and management
- Sales and marketing
- Customer care
- Invoicing and customer systems (CRM/BSS)
- Bad debts

(3) Other costs related to FWA (regulatory costs, etc.)

In addition to the above-mentioned network costs and retail costs, an efficient alternative operator may also have other relevant costs related to FWA that may be relevant in this context. One example of these kinds of costs is expenses as a result of regulatory obligations. These types of costs will also be taken into account in the margin squeeze test.

(4) Other common costs

Other common costs are costs linked to administration and management that cannot be attributed to the individual services. Equi-proportional mark-up (EPMU) is the method that is generally used when modelling LRIC costs. A percentage is calculated as the ratio of total common costs to total incremental costs. Using this method, costs are evenly distributed across all relevant services using the same ratio. Nkom finds this method appropriate to calculate other common costs in the margin squeeze test.

Principle 10

The following four types of cost categories will be used in the margin squeeze test:

- (1) Own network costs
- (2) Retail costs
- (3) Other costs related to FWA (regulatory costs, etc.)
- (4) Common costs

For retail costs, a category-by-category approach will be used in line with the categories presented by BEREC.

Nkom will use an EPMU approach to include a mark-up for other common costs.

3.11 Relevant regulated wholesale products

Nkom will include all the price elements that an access buyer has to pay for when buying the relevant wholesale products in the margin squeeze test. This includes, inter alia, recurring and non-recurring costs, termination of service costs, service provisioning and service cancellation. Nkom will apply current prices at the time of the test.

Nkom will furthermore apply the highest volume discount that FWA access buyers have achieved during the last 12 months.

Principle 11

Nkom will include all the price elements that an access buyer has to pay for when buying the relevant wholesale products in the margin squeeze test. This includes recurring and non-recurring costs, termination of service costs, service provisioning and service cancellation. Nkom will apply current prices at the time of the test.

Nkom will furthermore apply the highest volume discount that FWA access buyers have achieved during the last 12 months.

4 References

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