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Conference Paper

Development of a lean margin squeeze testing methodology

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Development of a lean Margin Squeeze Testing Methodology

Paper presented at
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in Rio de Janeiro, Brazil
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1 Introduction

- 1.1. This paper has been prepared by the authors as part of a project to develop a margin squeeze approach for broadband products based on wholesale products related to markets 4 and 5 for the National Regulatory Authority (NRA) ILR in Luxembourg in 2013.¹ The paper has been updated to recent developments.
- 1.2. The paper also is an approach to design a margin squeeze test according to the guidelines of the Commission's non-discrimination and costing Recommendation of 2013.²
- 1.3. The paper represents the opinion of the authors and not necessarily the position of ILR.

2 Definition of a margin squeeze

- 2.1. According to a definition of the European Group of Regulators (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.*"³ In a situation of a margin squeeze competitors are unable to replicate the retail prices of the SMP operator profitably.
- 2.2. The possibility for an integrated firm to engage in a margin squeeze practice depends on whether regulation allows the firm to choose upstream and downstream prices freely or rather restricts these choices. Under regulation of both wholesale prices and retail prices the SMP operator has no pricing instruments at its disposal. In theory, no margin squeeze should occur in such a situation. In practice, however, wholesale rates may not be properly cost oriented such that excessive wholesale profits may exist despite regulation. Moreover, retail prices may be subject to a price cap, which provides a ceiling to retail prices, but does not prevent operators from reducing prices. Even under regulation of wholesale and retail prices incentives to squeeze margins may not be excluded. Under partial regulation where wholesale prices are regulated but retail prices are left unregulated, the SMP operator can engage in a margin squeeze behaviour on downstream activities by lowering its retail prices. If wholesale and retail prices are unregulated, the SMP operator can squeeze through both access and retail prices. The most relevant situation of a regulatory margin squeeze test is when

¹ See the corresponding publication of ILR (2014).

² See European Commission (2013), Rec. 56ff.

³ See ERG (2009), p. 2.

wholesale prices are regulated and retail prices are unregulated. Competition problems of the situation of both prices being unregulated are more relevant for an ex post assessment by competition authorities.

- 2.3. According to the non-discrimination and costing Recommendation the European Commission is considering the ex-ante margin squeeze test to be a safeguard for competition in cases where no cost-oriented wholesale price regulation is in place or imposed.⁴ In the current practice of NRAs the scope of applying margin squeeze tests, however, is broader.
- 2.4. The key focus of margin squeeze in this sense is on the difference between the upstream and the downstream price; it is not on whether prices are excessive, discriminatory or predatory per se. Therefore, the margin squeeze concept differs from non-discrimination, predation and horizontal squeezing concepts (cross subsidisation, bundling, tying) although there are also strong links between these concepts.
- 2.5. The availability of proper wholesale products provided under non-discriminatory Equivalence of Input (Eol) obligations⁵ ensures the technical replicability of relevant retail products. It does, however, not guarantee their economic replicability. Only a proper margin squeeze test can ensure that the margin between the retail price of the relevant retail products and the price of the relevant regulated wholesale access covers the downstream costs and a reasonable amount of common costs.
- 2.6. If a margin squeeze test is not passed, competitors cannot trade profitably on the basis of the prevailing wholesale access charges. A margin squeeze results in economic distortions by foreclosure in the sense that efficient competitors may be excluded from the market.
- 2.7. Margin squeeze may also arise between different wholesale products.⁶ Margins between various wholesale products / business models along the vertical value chain are squeezed if there is not sufficient economic space (or margin) between various wholesale products such that various business models along the value chain of the ladder of investment are viable. Margin squeeze tests in this context shall ensure consistency of wholesale prices along the value chain based on the

⁴ See European Commission (2013).

⁵ The European Commission provides the following definition of the Eol concept: “*Equivalence of Inputs (Eol)*’ means the provision of services and information to internal and third-party access seekers on the same terms and conditions, including price and quality of service levels, within the same time scales using the same systems and processes, and with the same degree of reliability and performance. Eol as defined here may apply to the access products and associated and ancillary services necessary for providing the ‘wholesale inputs’ to internal and third-party access seekers.” (See European Commission (2013), Rec. 6(g)).

⁶ See the discussion of this issue in Oxera (2012) and ComReg (2013).

principle of competitive neutrality between different business models. Vertical consistency of pricing should enable efficient competition at different levels of the value chain.

- 2.8. Consistency in wholesale price regulation requires that efficient business models can survive in the market: Competitors should be able to earn a sufficient margin over and above wholesale costs to cover all downstream costs including a return on capital which covers the relevant cost of capital. This rule is independent of the degree of "make or buy" investment of various business models. It supports the regulators' neutrality towards business models. It should not be up to the regulator to pick successful business models ex ante.
- 2.9. A margin squeeze test 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 by a relevant revenue or a relevant cost generated by the product for which the margin squeeze test is conducted. Relevant downstream costs are the own network costs of the alternative network operator (altnet) plus its retail cost. The margin squeeze test is passed if the relevant revenues are not lower than the sum of wholesale and downstream costs. Under this condition, the reference operator earns (at least) a profit margin which is determined by the cost of capital (e.g. weighted average cost of capital, WACC) representing a market return on capital.
- 2.10. Margin squeezing is a form of anti-competitive behaviour which can lead to foreclosure of competition. Foreclosure may not only result in forcing market exit of competitors. It also may discourage entry, discourage expansion and may disadvantage rivals such that they compete less aggressively. In each of these cases a margin squeeze distorts competition to the detriment of end-users.
- 2.11. Margin squeeze obligations and margin squeeze tests should prevent vertical leveraging, e.g. by extending a dominant position in a wholesale market to a corresponding downstream (retail market). To avoid undue leveraging of market power, competitors must be able to replicate the retail price of the SMP operator. Margin squeeze tests aim at fostering competition by contributing to a level playing field.
- 2.12. Reference standard for a margin squeeze test is a retail market with effective competition, which must not necessarily reflect actual market conditions. This also means that the reference point of a margin squeeze test is a hypothetical operator which is competing in such a retail market under efficient operation.

2.13. Although the principle of non-discrimination addresses different behavioural aspects as margin squeeze, there are important interfaces between the two regulatory principles. A detailed non-discrimination obligation is a prerequisite to focus on economic replication in the context of margin squeeze. If the proper wholesale services in terms of technical features and quality are not available, by definition economic replicability is impossible. The provision of wholesale services under non-discriminatory conditions only provides the opportunity for technical replicability and therefore is a prerequisite for economic replicability. Applying margin squeeze tests therefore implicitly assumes that the competitive environment is characterised by non-discrimination. The availability of proper wholesale services not only has a technical dimension. Wholesale service availability by itself is not sufficient for a level playing field and efficient business planning. Furthermore, wholesale pricing has to be transparent and prices have to be known before new retail services are launched.

3 Application of the margin squeeze test for flagship products

- 3.1. In principle margin squeeze tests should be applied such that competitive distortions should be excluded for all relevant constellations and products. This could mean that margin squeeze tests might have to be applied for hundreds of products. Such excessive application of margin squeeze tests can generate a significant regulatory burden for the NRA and for market players as well. Applying just one test on all broadband retail services on the other hand may solve the problem of regulatory burden but may be inadequate to exclude discriminatory pricing behaviour of incumbents. Having these different directions in mind the Commission recommended not to run the test for each and every new retail offer but only in relation to flagship products as identified by the NRA.⁷ The Commission provided only a rather weak definition of flagship products, namely such that they represent “the most relevant retail products”.⁸ For practical regulatory policy this definition needs to be made more operational.
- 3.2. Competitors should be able to replicate the SMP operator’s retail prices of flagship products. Flagship products include the most relevant retail products offered by the SMP operator in the broadband market on the basis of the identified and predefined wholesale products. We propose to define flagship products as those products which in sum represent a revenue share of 70% of all retail products of the SMP operator in the broadband market. To identify the most important retail products broadband retail products (stand-alone broadband products or bundles that include broadband internet access) have to be listed

⁷ See European Commission (2013) recital (66).

⁸ See European Commission (2013), recital (67).

according to their revenue share in a descending order. Additionally, all products which represent a revenue share of at least 10% are treated as flagship products. Figure 2 describes the test structure on that basis.

- 3.3. Flagship products should be identified on the basis of their revenues of the calendar year before the margin squeeze test is being conducted. Each time a new retail product becomes a flagship product according to the two criteria defined in para. 3.2, a new margin squeeze test has to be conducted related to the new flagship product.
- 3.4. A flagship product can be a standalone or a bundle product. The actual preferences of users will decide which products are representative for the market, mostly relevant for competition, and therefore have to be subject to a margin squeeze test. The NRA may consider that there may be competitive problems associated with products which are not flagship products. According to the definition proposed they are, however, not representative for the retail market and may not cause significant harm to competition. The dynamic definition and testing approach proposed furthermore guarantees that products which gain market share fast and become relevant and representative for the retail market have to be offered margin squeeze free. The NRA may, however, reserve the right to apply the margin squeeze test also to retail products which are not flagship products but which have a particular relevance to special user groups.
- 3.5. Bundle products which are flagship products are tested if they are produced on the basis of regulated wholesale products. This does not exclude that the SMP operator bundles products with other retail products which are not produced on the basis of regulated wholesale products. Such bundling offerings should not be prohibited. There only have to be safeguards to make sure that such bundling activities do not interfere with the margin squeeze approach to be applied.⁹ There is reason to assume that competitive distortions do not occur if either competitors or the customers can replicate the bundle consisting of the flagship product and the additional product which is bundled to it. This condition is met if the additional product is also provided as a standalone product in a competitive market. This means that the flagship product and the additional product are not offered as a pure bundle. In case the standalone price of the additional product is higher than the component price of purchasing the product as part of a bundle in combination with the flagship product, the NRA should allocate the difference as a rebate to the flagship product. In case no standalone price of the SMP operator for the additional product is available, the NRA should represent this standalone price by a relevant market price.

⁹ See the discussion of justified bundling and market situations in which bundling may cause competitive problems by BNetzA (2005).

- 3.6. The general rule developed in para. 3.5 has some practical implications when conducting the margin squeeze test. Where the bundle involves products from other markets which may or may not be available to competitors, the revenues and costs of such additional services have to be removed from or simply are not included in the margin squeeze calculation. This procedure ensures that only “regulated products” are considered in the margin squeeze calculation. This includes wholesale products and corresponding retail products, which are produced on the basis of such wholesale products.
- 3.7. Besides the application to flagship products, the NRA should reserve the right to apply the margin squeeze test to products which it regards as essential and characteristic for specific market segments not properly represented by the general concept of flagship products.

4 Margin squeeze tests – The general approach

- 4.1. Three different tests 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 similarly efficient operator (SEO) test.¹⁰ Each testing approach has its merits and its limitations.
- 4.2. The EEO test identifies whether the SMP firm’s downstream operation trades profitability if it had to pay for its own business production the wholesale price equivalent to its rivals. Therefore the EEO test relies on the SMP operator’s costs and scale of operations. This test has its roots in competition law. The application of competition law favours the EEO test because it cannot be expected from the dominant operator to set prices based on rivals’ cost, which are unknown to him. When margin squeeze tests are applied ex ante by NRAs, no such problem arises in principle.
- 4.3. Applying an EEO test would not reveal a margin squeeze (although it exists in reality) in case of economies of scale in downstream costs and/or if there are cost items which are relevant for competitors but irrelevant for SMP operators. Economies of scale, economies of scope between wholesale and downstream business, learning curve effects and first mover advantages may result in lower costs for the SMP operator compared to its competitors. On the other hand, inefficiencies in the downstream activities of the SMP operator (e.g. taking the form of excessive marketing and sales costs) might result in higher costs.

¹⁰ The pros and cons of the EEO and REO tests were first discussed in the European Commission’s Access Notice (See European Commission (1998)).

- 4.4. In particular if economies of scale at the level of downstream costs (own network infrastructure, retail costs) prevail, the EEO test on the basis of costs and market shares of the dominant operator would not reveal a margin squeeze. An efficient competitor may nevertheless be unable to replicate the dominant operator's retail price. The test results in a circularity in this situation which can only be avoided by using the REO test. The circularity can only be avoided if the margin squeeze test is conducted under the assumption that the downstream market will be reasonably competitive.¹¹ This assumption cannot be materialised by relying the test on the dominant operator's market share and costs. The efficient operator as referred to in this context has a market share which allows effective competition by several operators in the market.
- 4.5. On the basis of the REO test there is no margin squeeze if the difference between the SMP operator's retail and wholesale prices are sufficient for a reasonably efficient downstream competitor to earn a normal profit. Point of reference is a hypothetical operator, not (necessarily) a specific operator in the market. This REO has to be defined by its business model, the scope of its service portfolio, the geographic coverage of its business model and finally its market share. The calculations are based on entrants' costs and volumes. Conceptually, the relevant market share has to be determined based on the concept of minimal efficient scale. NRAs often use a 20% to 25% market share. This target market share may have to be differentiated according to the business model; it may further be adopted by size of country and according to actual concentration in the market.
- 4.6. The basic difference between the REO test and the EEO test relates to the relevant cost. While the EEO test rests on the downstream cost of the dominant operator, the REO test relies on the altnet's cost. This is of particular importance when market shares differ significantly and economies of scale are relevant in the respective range of market shares. This is basically the case in the NGA context where economies of scale might be quite significant.
- 4.7. The SEO test considers a hypothetical operator which shares the same basic cost function as the SMP operator but does not enjoy the same economies of scale and scope. In practical terms the costs of the SMP operator are being used as in the EEO test and modified according to scale. Conceptually, the SEO test is similar to the REO test but it solves the information problem of relevant data in a different way.¹²
- 4.8. The REO test is more in line with the basic goal of promoting competition. Furthermore, it is the only test able to identify and to include relevant cost which

¹¹ See the discussion of the relevance of economies of scale and scope in a margin squeeze context in the annex of ERG (2004).

¹² See the application of the SEO test approach applied by the Irish NRA ComReg (2013).

occur for altnets and not for SMP operators.¹³ Thus, the REO test better fits with the competition problems in the real world than any other test.

- 4.9. The EEO test relies on static efficiencies. The REO test on the other hand is more relying on the dynamic efficiency gains of competition¹⁴ which are expected to overcome (potential) static inefficiencies. The REO test might lead to temporarily higher end-user prices compared to applying the EEO test.
- 4.10. In principle the NRA has the possibility to combine the merits of the EEO test with those of the REO test standard by means of its procedural rules to implement the test in practice. For that purpose the NRA may request that the SMP operator will present a margin squeeze test to prove compliance with the margin squeeze remedy. The SMP operator will have to conduct the test on the basis of its downstream costs. The NRA will, however, prescribe the structure of the margin squeeze model. Furthermore, the NRA will prescribe certain parameters of the model, in particular those where it expects major cost differences between the SMP operator and altnets. These parameters will be identified by means of a market survey. To take care of the relevant cost differences and differences in the composition of customers, the NRA may furthermore invite other market participants to provide their own margin squeeze analyses which the NRA will take into consideration during the process of testing the compliance of the margin squeeze results. By means of this procedure the NRA will effectively apply a SEO test approach enhanced by competitor specific costs not incurred by the access provider (colocation etc.).
- 4.11. According to a recent survey of the European Regulators Body BEREC¹⁵, a majority of the NRAs who answered the questionnaire (21 NRAs) use the REO or an adjusted EEO test (12 NRAs), while 9 NRAs used the EEO test in their current margin squeeze practice. Only a few (5 NRAs) defined the generic or hypothetical operator in the test on the basis of market share (5%, 15%, or 25%).

5 The relevant business model(s)

- 5.1. To conduct a margin squeeze test, the business model on which to apply the test has to be specified first. A margin squeeze test has to be specified and should be conducted for each business model based on a particular wholesale product separately and not for a combination of business models/wholesale products. Relying the test on a combination of wholesale products would lead to circularities

¹³ See the discussion of the concept of the efficient operator in a margin squeeze context by the German NRA BNetzA (2007).

¹⁴ See BEREC (2014), p. 9.

¹⁵ See BEREC (2014), p. 18f.

in the testing approach. NRAs should be neutral with regard to business models. Therefore, they have to apply margin squeeze tests for all relevant business models in the market.

- 5.2. The most relevant business model of alternative operators usually is to provide voice telephony and broadband internet access. The most relevant wholesale product to provide retail broadband internet access usually is the wholesale broadband access product bitstream or access to the unbundled local loop or in case of VDSL access to the unbundled subloop. The most relevant wholesale product for fixed voice telephony access is the wholesale line rental combined with Carrier (Pre)-Selection services. Using a passive wholesale product is of particular relevance in the case of fibre-based products.
- 5.3. The business model also has to be defined by its geographic scope. Costs should be calculated on a geographic market consistent with the market analysis of the relevant market(s). If markets are defined as national markets then the geographic scope of the margin squeeze test should cover the whole country.

6 The relevant cost standard

- 6.1. For consistency reasons NRAs should consider LRIC+ costs of providing the relevant downstream service as the appropriate cost standard.¹⁶ Only 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, which can be the whole output of the product in question or just the incremental output associated with the activity under consideration. LRIC includes all product-specific cost even those which are sunk. LRIC+ includes a mark-up for common/overhead costs for the relevant service. To ensure replication by efficient operators, the relevant increment should be defined such that it includes all relevant direct and indirect downstream costs.
- 6.2. 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. Only the LRIC+ standard is consistent with market entry decisions which require all relevant costs to be covered in the long-term.
- 6.3. Relying on total or fully distributed costs is not appropriate because these cost standards ignore efficiency considerations.

¹⁶ This is also in line with the recommendation of BEREC (2013), p.34.

- 6.4. The recent BEREC survey on regulatory practice of European NRAs in applying ex ante margin squeeze tests¹⁷ shows that most of the NRAs use different combinations of cost standards, as appropriate for retail or relevant wholesale costs. 8 NRAs (out of 21) used the LRIC standard, 3 the FAC standard and 10 a combination of cost standards. Retail costs are often assessed according to the FAC standard. FAC/FDC based costs are often chosen for the practical reason that they can be extracted from the SMP operator's financial accounts.

7 The relevant cost of capital

- 7.1. 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 should reflect the risk of the retail business of the reasonably 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. Using the SMP operator's WACC in particular the WACC used for calculating regulated wholesale prices is inappropriate to identify the relevant capital costs.
- 7.2. In the recent BEREC survey on the current regulatory practice of European NRAs¹⁸ all (19 out of 20) but one NRA use the WACC as the reasonable profit indicator in the context of the margin squeeze test.

8 Relevant regulated wholesale inputs

- 8.1. The NRA has to identify those regulated wholesale inputs which are used by access seekers to provide the flagship retail products as referred to in para. 3.2. Potentially all regulated wholesale inputs in (the previous) markets 4 and 5 may be eligible and relevant.
- 8.2. The relationship between the relevant retail service and a relevant wholesale service may be direct and unambiguous. It can also be complex, in particular when several distinct wholesale services support relevant downstream services. The relationship then depends on the business model of the altnet. In such case the NRA may either consider different business models capable of producing the same relevant retail products or may focus on those business model(s) which are most representative for their national market.

¹⁷ See BEREC (2014), p. 19ff.

¹⁸ See BEREC (2014), p. 20.

- 8.3. In case a new wholesale product is being introduced and the NRA expects substantial demand for the new product, the NRA may require a margin squeeze test related to relevant retail products based on the new wholesale product.
- 8.4. 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 volumes 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 which is usually the customer life time for the corresponding retail service. Volume discounts and/or long-term access pricing agreements 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.

9 Retail prices

- 9.1. 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. One-off pricing elements (e.g. connection charges) should be split between periods which are in line with usual customer lifetimes of the service in question. The test will be applied and has to be met for each flagship product individually.
- 9.2. Depending on the business model (net) revenues from inbound call termination may need to be considered as part of the relevant revenues.
- 9.3. If weighting of relevant product elements, tariffs and/or customer groups is needed to calculate the relevant revenues neither the SMP operator's nor the altnets' structure should be used, but the market average (e.g. different usage patterns between peak and off-peak telephony usage). The NRA may fix key customer distribution parameters in advance.
- 9.4. 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 holds for promotions such that 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. Market prices should become relevant if significant procurement advantages of the SMP operator are expected or if no purchase prices are available.

10 Relevant period

- 10.1. A margin squeeze test has to be carried out over a reasonable timeframe. The test can be conducted on a period-by-period approach or in a multi-period approach. A period-by-period approach repeats the test regularly. The relevant period can be a month, a year or a two year period. 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. The cash flows for the retail products under consideration will then be discounted by using a discounted cash flow (DCF) approach.¹⁹ 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 rather long period that includes the whole product lifetime or even multiple investment cycles.
- 10.2. The period-by-period test can take as a basis for analysis the accounting year or a steady state. 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.
- 10.3. 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 which in most cases means an allocation according to the average customer lifetime. Allocation by means of using the annuity formula solves both the proper allocation over time and the financing of non-recurring costs or revenues.
- 10.4. We have a preference for using the steady state approach for the following reasons: The accounting year 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 asymmetric distribution of non-recurring costs and revenues over time. The steady state as well as the DCF approaches avoid such accounting distortions.

¹⁹ For comparing the pros and cons of a DCF and a period-by-period approach see ERG (2009), p.14f.

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 relevant parameters over a relatively long period of time. A major shortcoming of the DCF method is, however, that it does not specify how costs should be recovered over different years.²⁰ A positive NPV could be the result of anti-competitive behaviour. The steady state approach combines the benefits of both approaches. It provides margin squeeze information for each particular period. At the same time costs and revenues are properly allocated over time. Furthermore, this approach best reflects the hypothetical efficient operator as a point of reference.

10.5. There is no uniform current regulatory practice with regard to testing profitability over time.²¹ Some NRAs use a period-by period and some a combination of a DCF approach and a period-by-period approach. Only one NRA uses a DCF approach only. The period-by-period approaches are usually applied by using a customer lifetime approach. The average customer lifetime then is used as the relevant period. This period ranges from two years to five years.

11 Relevant downstream costs

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

- (1) Own network cost;
- (2) Costs for terminating traffic in other networks;
- (3) Retail costs;
- (4) Common cost.

11.2. Depending on the business model the competitor's own network cost may consist of the following elements:

- xDSL equipment like modem and DSLAM
- Backbone (network nodes and links)
- VoIP platform
- Cost related to interconnection locations
- Operating and maintenance costs
- Capital costs related to network infrastructure

²⁰ See ERG (2009), p. 15.

²¹ See the BEREC survey (2014), p. 22 ff.

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

11.3. 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. These can be regulated or negotiated rates.

11.4. Retail costs include the following cost categories:

- Product management,
- Marketing and sales,
- Customer acquisition and customer retention,
- Customer services (including call centre services),
- Billing and collecting,
- Bad debt,
- Accounting,
- IT.

11.5. Retail costs can be represented category-by-category according to the categories mentioned in para. 11.4 or by using a global mark-up on the sum of wholesale and network costs. Both methods have their pros and cons. The identification of retail costs category-by-category enables to show such costs according to their actual cost drivers. On the other hand, cost accounting systems may be limited to reveal each cost category separately. Furthermore, it may be easier and more reliable to benchmark retail costs on the basis of a broader cost category compared to individual cost items. In addition, a global mark-up approach better addresses the substitution effects between the different cost categories depending on the business strategies of various operators. In case of using a global mark-up, promotions and special discounts would not be part of the global retail mark-up but would be calculated separately by reducing list prices accordingly.

11.6. Common cost are cost on the level of administration and management that cannot be allocated to individual services according to relevant cost drivers. Equi-proportional mark-up (EPMU) is the methodology that is commonly adopted in relation to LRIC cost-modelling. Utilising this method, costs are spread across all relevant services by the same percentage. Alternatively a common cost mark-up may be applied to the own network and the retail costs respectively.

12 Procedural aspects of applying the margin squeeze test

- 12.1. The ex ante margin squeeze test, as shown in Figure 1, shall be applied each time a new wholesale price in markets 4 and 5 is determined and/or a new wholesale product is being introduced, if and insofar as flagship products are produced in using such wholesale inputs. An ex ante margin squeeze test will also be applied if the SMP operator intends to change a wholesale price. The tests must be provided to the NRA a relevant number of days before the scheduled launch of the new wholesale product or before the new wholesale price shall become effective.
- 12.2. The SMP operator will have to show, that there is no margin squeeze on the basis of the prevailing retail prices for flagship products as defined in para. 3.2 and on the basis of the intended wholesale prices.
- 12.3. The margin squeeze test results provided have to be compliant with the margin squeeze test requirements set by the NRA. Furthermore, the SMP operator will have to use the parameter values fixed by the NRA to conduct its margin squeeze test. Parameters not fixed by the NRA have to be filled from cost, revenue and other information provided by the SMP operator.
- 12.4. The ex-ante margin squeeze test should be conducted in a forward-looking sense. Relevant parameters on costs and revenues should be representative for the following two years. This does not exclude that some parameters are induced from information stemming from previous periods, in particular as long as it can be assumed that such information is also representative for the following two years.
- 12.5. In addition to presenting the margin squeeze test as referred to in para. 12.1, the SMP operator will have to present a margin squeeze test each time and at that moment in time a product becomes a flagship product.
- 12.6. At a specified time of each calendar year following the year where the NRA's margin squeeze test has been implemented first the SMP operator will have to present an ex post margin squeeze test for all flagship products for which the test has been conducted ex ante. The ex post test has to be conducted on the actual costs, revenues and other parameters having occurred in the previous calendar year. All temporary pricing measures actually used and not foreseen in the ex ante margin squeeze test have to be included into the ex post test. The margin calculation will take care of the relevant number of months of such measures. In case no new cost data is available, the ex post margin squeeze test shall be conducted using the same data as used in the last ex ante test.
- 12.7. The NRA will reserve the right to request additional margin squeeze tests under reasonable and proportionate circumstances. This may in particular be the case if

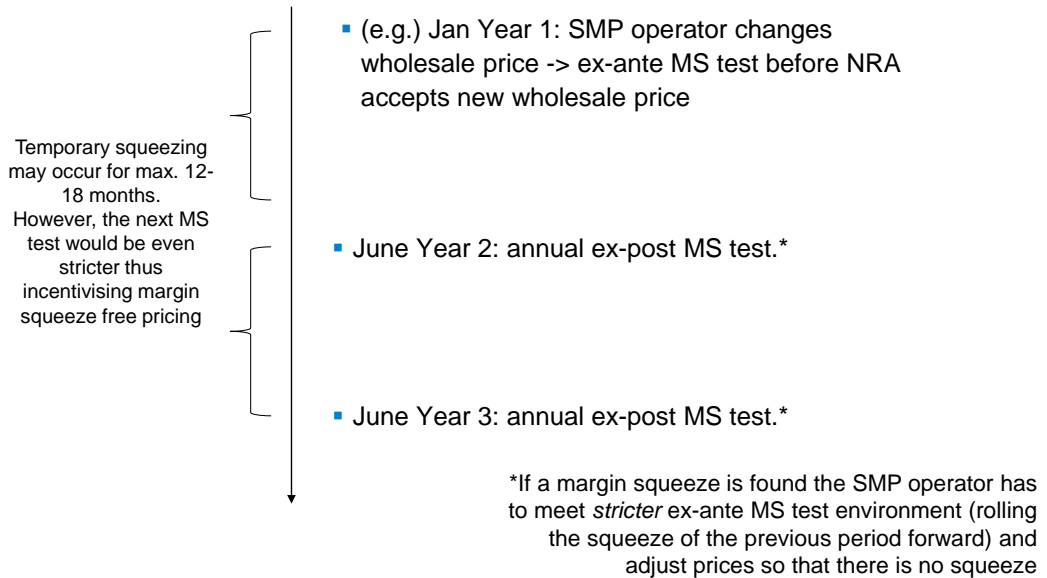
competitors make justified complaints based on the reason of major market changes related to costs, prices, and customer distribution which would lead to different results compared to the original ex ante margin squeeze test.

- 12.8. In checking the compliance of the margin squeeze test provided by the SMP operator the NRA should reserve the right to substitute certain parameters used by the SMP operator by those which it considers as more appropriate to represent the relevant costs and revenues of competitors.
- 12.9. The NRA should regularly publish guidelines for conducting the margin squeeze test which the SMP operator has to comply with. These guidelines should include the margin squeeze calculation model as well as certain parameters of that model.
- 12.10. The NRA may identify relevant parameters of the margin squeeze model by means of a market survey, in general every two years.

13 Consequences of an identified margin squeeze

- 13.1. Because the SMP operator will be under the obligation to set retail prices on the basis of the regulated wholesale prices such that no margin squeeze occurs, the NRA should assume that the margin squeeze test conducted and provided by the SMP operator will not exhibit a margin squeeze. The NRA can, however, not exclude the situation that a margin squeeze could occur once it has assessed the calculation approach provided by the SMP operator.
- 13.2. In case a margin squeeze has been identified in the ex ante test, the NRA will request the SMP operator to adopt the relevant prices in such a way that the margin squeeze situation is abolished. A new margin squeeze calculation shall show compliance with this requirement. The new wholesale prices can only come into force if such compliance has been testified by the NRA. If the new margin squeeze test does not prove compliance, the NRA will request the SMP operator to change the intended wholesale price such that a margin squeeze no longer occurs.
- 13.3. In case the ex post margin squeeze test provided by the SMP operator and testified by the NRA reveals a margin squeeze, the NRA may impose a different set of consequences. In such a case the NRA should request a new ex-ante test to be conducted on the basis of the actual retail and wholesale prices at that moment in time. In addition, we propose to roll forward the negative margin identified in the ex post test related to a particular wholesale product to the ex ante margin squeeze test. If, for example, the ex post margin squeeze reveals a negative margin (revenue minus cost) of 7% for a particular product, then the ex

ante margin squeeze test for the same product will be conducted under the condition that the test generates a positive margin of (at least) 7%. An exemplary timeline for initial and subsequent tests is shown in the following figure.



13.4. Alternatively to the approach described in para. 13.3 the NRA would have to require the SMP operator to conduct, check and testify a new margin squeeze test each time the price (or a certain price element) of a flagship product is going to be changed. The mechanism proposed here provides more pricing flexibility to the SMP operator, is more efficient in terms of cost of regulation and protects competition as well, compared to permanently conducting margin squeeze tests.

13.5. The following table summarizes the different tests:

Triggers for an ex-ante test	Triggers for an ex-post test
When the SMP operator intends to change the price of a wholesale service	Annual test on a specified time with data from the past period
When the SMP operator intends to introduce a new wholesale product	Upon complaints of market players
When a retail product becomes a flagship product	
When the ex-post test reveals a margin squeeze	

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15 Annex

Figure 1: Basis structure of the test

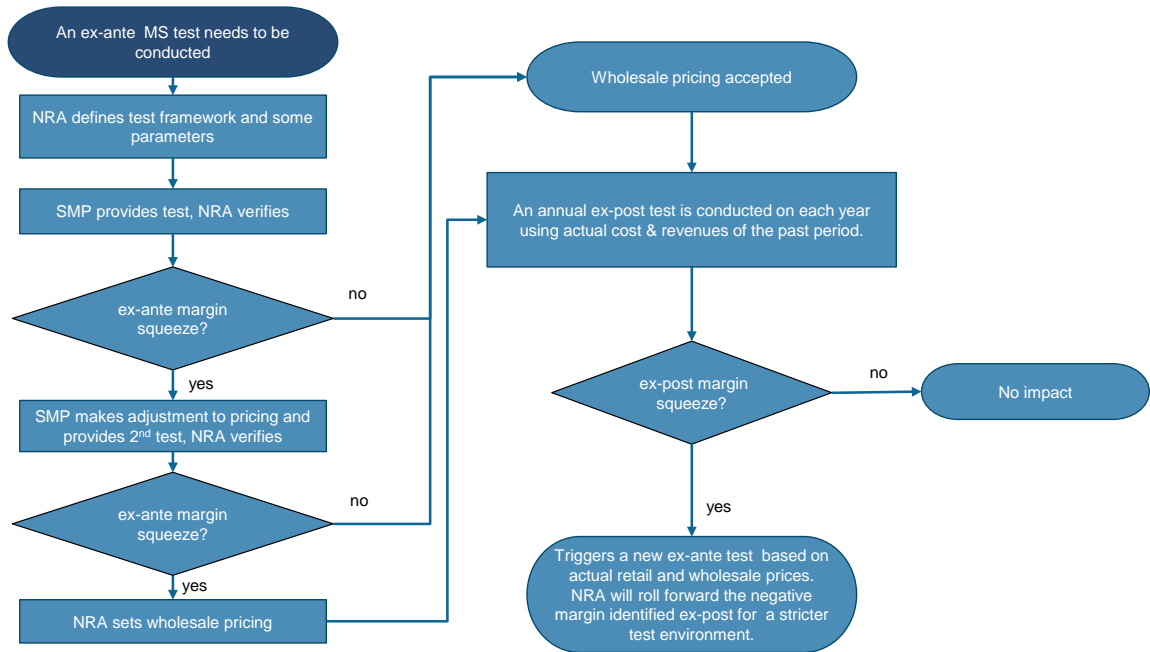
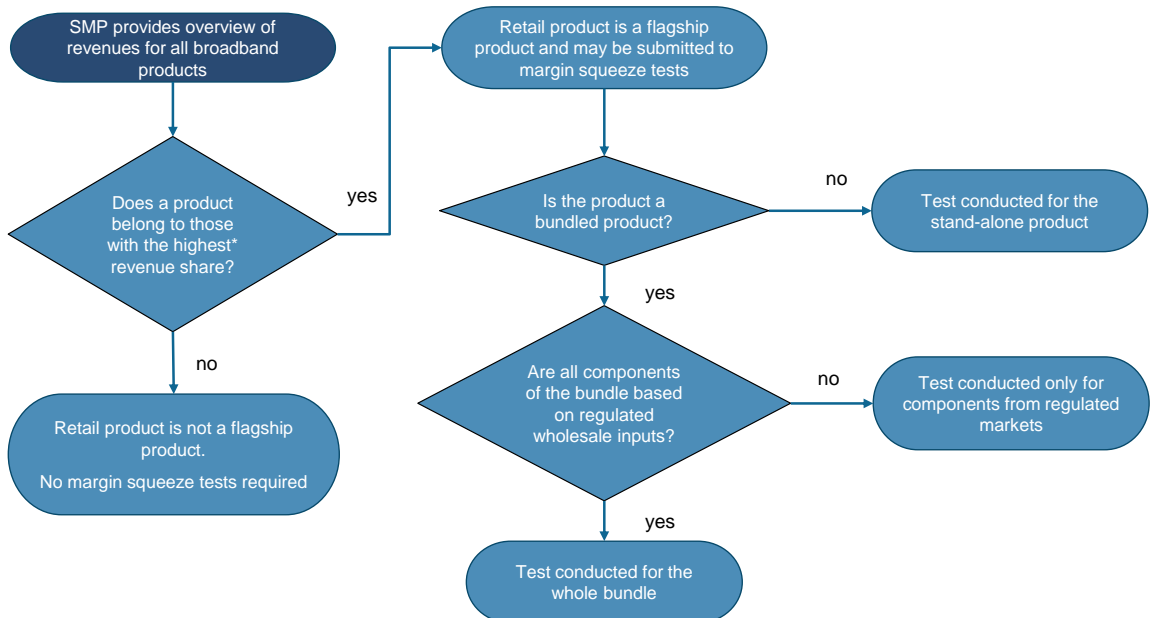


Figure 2: Identifying flagship products



*Flagship products = products which in sum represent a revenue share of 70% of all retail products of the SMP operator in the broadband market. Additionally, all products which represent a revenue share of at least 10% are treated as flagship products.

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