Viestintävirasto
Kommunikationsverket
Finnish Communications
Regulatory Authority

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FICORA'S PRINCIPLES FOR ASSESSING MOBILE TERMINATION PRICING

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1. SCOPE OF APPLICATION AND GENERAL PRINCIPLES FOR MOBILE TERMINATION PRICING

In its operator-specific SMP decisions[1] that are based on market analysis, FICORA has imposed obligations (non-discriminatory and cost-orientation) on national mobile network operators operating in Finland (DNA Verkot Oy, Elisa Oyj and Sonera Mobile Networks Oy) concerning pricing in the market for voice call termination on individual mobile networks (M16). FICORA gave the first SMP decisions in compliance with the new Communications Market Act (393/2003) on 6 February 2004[2], and the following on 22 June 2006.

These assessment principles concern FICORA's methods for assessing the pricing of voice call termination on individual mobile networks and the calculations on which the assessment is based.

According to section 43(3) of the Communications Market Act, call termination, or incoming traffic, means the use of the telephone network by a telecommunications operator to form a connection, where this connection is from the telephone network of another telecommunications operator to the telecommunications operator's own telephone network. Call termination is traffic from the interconnection point to the recipient of a call.

Call termination on mobile networks means traffic from all other telecommunication networks to mobile networks. For instance, traffic may terminate on an individual network from other national or foreign mobile networks and national or foreign fixed networks. The voice call termination service is a homogeneous product which involves transmission of voice in the destination network. Mobile network operators collect minute-based charges at wholesale level from other network operators for the voice call traffic terminating on their own network. Since 1 June 2005, the charges collected by the operators for call termination have been the following: DNA 10 cents/minute, Elisa 8,4 cents/minute and Sonera 6,8 cents/minute.

Traffic between mobile network operators is reciprocal, and the charges for call termination are indirectly channeled into the end customer prices for calls between mobile networks. Traffic between fixed networks and mobile networks is not equally reciprocal. The prices for call termination on fixed networks and mobile networks differ from each other significantly. The price a mobile operator collects for call termination is, in practice, directly channeled into the end customer price for a call made from a fixed network to a mobile network.

The mobile termination service cannot be bought unless the communication network is interconnected to the mobile network. Interconnection and buying of call termination services requires the introduction and maintenance of the interconnection circuit link and the connection, modification and maintenance of the common channel signalling interface. Operators often collect one-off charges for interconnection that is necessary for implementing voice call termination. In determining prices also for these regulated products, operators must fulfil the pricing obligations imposed on them.

According to section 84 of the Communications Market Act, a cost-oriented price means a price that is reasonable taking into account the costs incurred and the efficiency of the operation. A reasonable return on capital employed is also taken into account. Call termination must be cost-oriented regardless of the pricing structure. The costs for interconnection traffic in call termination are the same regardless of where the call comes from. Bulk discounts on interconnection charges are prohibited, since according to section 44 of the Communications Market Act, the charge collected for the interconnection of telephone networks shall not be dependent on the amount of telecommunications transmitted.

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[1] http://www.ficora.fi/index/saadokset/tulkinnat/hmvpaatokset/hmv16.html (in Finnish)

[2] The Supreme Administrative Court repealed by decisions of 28 October 2005 (record no. 2738, 2739 and 2740) FICORA's decisions of 6 February 2004 on Finnet Verkot Oy's, Sonera Mobile Networks Oy's and Elisa Oyj's significant market power regarding voice call termination on individual mobile networks. The Supreme Administrative Court returned the case to FICORA for new investigation. The Supreme Administrative Court provided that FICORA's decisions must be followed until the case has been resolved or FICORA provides otherwise. FICORA issued new decisions on 22 June 2006. DNA and Elisa have appealed the decision to the Supreme Administrative Court. DNA also requested that execution of FICORA's decision should be interrupted.

According to section 86 of the Communications Market Act, a telecommunications operator has an obligation to prove that the price charged for its product is cost-oriented and non-discriminatory when a pricing matter is being handled by the Finnish Communications Regulatory Authority (FICORA). On request, a telecommunications operator must submit to FICORA up-to-date and sufficiently detailed pricing calculations on which the prices charged for call termination are based. FICORA assesses the legality of the charges collected by the telecommunications operator primarily on the basis of these calculations but is not bound to the cost-accounting and pricing principles used by the telecommunications operator.

FICORA assesses the legality of the pricing of call termination in compliance with the principles referred to in this memorandum. However, FICORA continues to develop the methods for assessing the pricing of call termination on mobile networks in cooperation with mobile network operators and with the assistance of external experts. FICORA shall update the principles presented in the memorandum when necessary.

2. DESCRIPTION OF FICORA'S ASSESSMENT METHOD

In 1998, FICORA began to establish whether the charges collected for call termination and origination on mobile networks are cost-oriented. The first decision on the cost-orientedness of the charges collected for interconnection traffic in mobile networks was issued in April 2001, when FICORA stated that the charges collected by Sonera were not cost-oriented. Sonera appealed against the decision, and the Supreme Administrative Court gave its final judgment in September 2004. The Supreme Administrative Court dismissed the claim and FICORA's decision entered into force. The judgment of the Supreme Administrative Court confirmed certain main principles for the assessment of cost-oriented pricing (in particular the definition of capital employed).

In order to develop the process for assessing pricing, FICORA commissioned Frontier Economics Ltd[3] in 2005 to prepare a study of the evaluation process for determining the cost-oriented mobile termination prices. The study contains propositions and recommendations for the principles FICORA may use to assess cost-oriented prices and increase the transparency of the process for assessing the prices. The report also included a tool (Excel model) created for FICORA for allocating costs and assessing charges for call termination.

FICORA has developed its assessment methods further and presents in this memorandum the principles it shall use to assess whether the charges for call termination in mobile networks are cost-oriented. The principles have mainly remained the same, and they comply both with FICORA's previous policy and the policy of administrative courts. However, FICORA has in part defined further its principles in this memorandum and, for instance, given its opinion on reasonable return in mobile network communications. FICORA assesses the prices determined by all SMP mobile network operators operating nationwide in Finland according to the same principles.

For assessing pricing, FICORA uses the FAC model (Fully Allocated Costs) that is based on the operator's actual costs. Thus, the model used by FICORA in assessing pricing is a so-called top-down model. ERG (European Regulators Group) published in 2005 its opinion on the commission's recommendation for separating activities and cost-accounting procedures. In the opinion, ERG recommends, for example, the use of the FAC method. The Communications Market Act provides that the costs incurred must be taken into account, and therefore it is justified to use the FAC model in Finland. The FAC model is generally applied in other EU countries as well, especially in the mobile market.

FICORA has developed its own version of the model developed by Frontier Economics Ltd for allocating costs, the FIFAC model (Ficora Fully Allocated Costs), which it uses for assessing the pricing of call termination on mobile networks. FICORA uses the FIFAC model also to gather cost and volume data necessary for assessing the pricing of call termination on mobile networks and the allocation keys used in the calculations.

[3] The study is available at http://www.ficora.fi/index/saadokset/ohjeet/taloudellinenvalvonta/matkaviestinverkkoihinlaskevanliikenteenhinnoitteluakoskevatutkimus.html

The FIFAC model involves measuring the actual operating and overhead costs incurred to an operator, as well as depreciations and return on capital. The operating and overhead costs are measured on the basis of historical cost accounting, and capital costs on the basis of current cost accounting. The model also involves allocating the mobile network operator's costs first to mobile network components in accordance with the matching principle and then to mobile network services in accordance with the use of and load on the network. The result of the model is an estimate of the unit costs for services, such as the unit cost for call termination on mobile networks.

3. MOBILE NETWORK STRUCTURE AND NETWORK SERVICES

Mobile networks can be divided into a network and switching subsystem (NSS), a base station subsystem (BSS) and an operations subsystem (OSS) which administers the previous two subsystems. The network and switching subsystem consists of mobile services switching centres (MSC) and registers connected with them (for example, home location, visitor location, and equipment identity registers). The base station subsystem consists, for instance, of base stations (BTS) and base station controllers (BSC). The network also comprises transmission connections between different network elements. The connection between a subscriber's terminal and a base station is wireless. Therefore, radio frequencies are needed in the operations of a mobile operator. Figure 1 gives a basic example of the structure and components of a mobile network.

A mobile network is used, for instance, for
1) traffic from an interconnection point between other telecommunications networks and the mobile network to the recipient of a call (call termination),
2) traffic from a mobile network subscriber to an interconnection point between the mobile network and other telecommunications networks (call origination),
3) traffic between mobile network subscribers (on-net traffic) and
4) other services, such as SMS and data services.

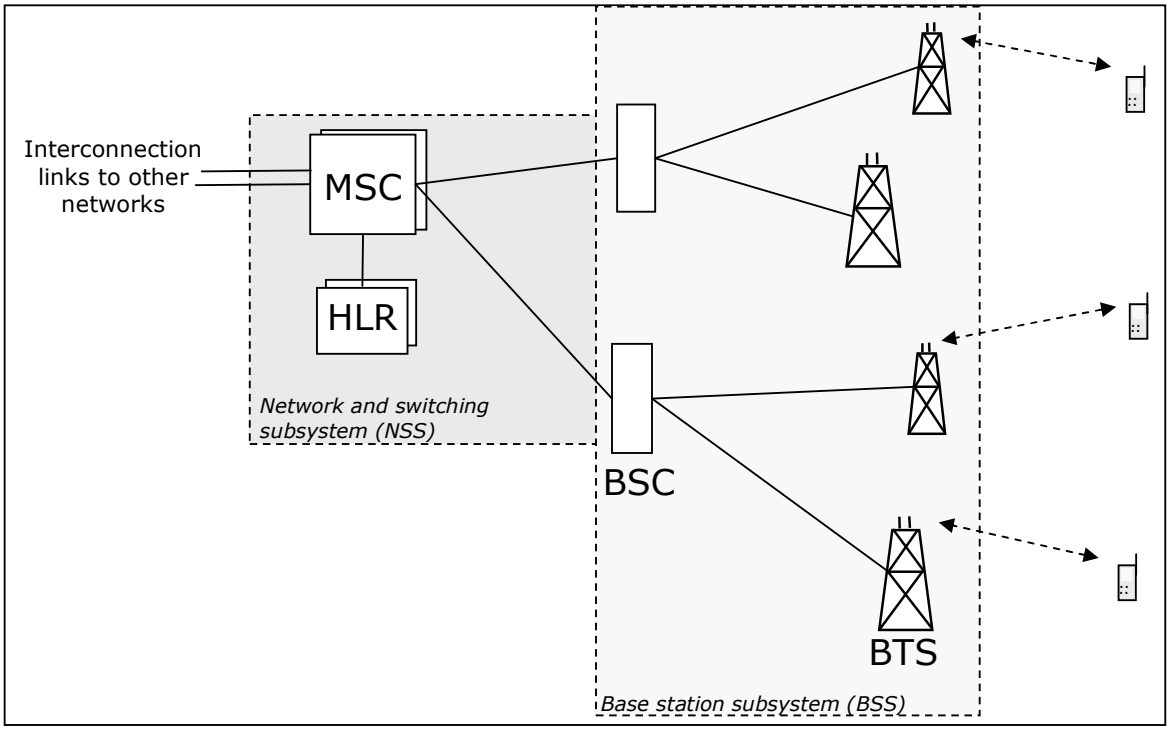

FIGURE 1 Mobile network structure

4. COST ITEMS TO BE INCLUDED IN THE CALCULATIONS

FICORA's assessment of whether the charges are cost-oriented is primarily based on the cost and volume data provided by telecommunications operators. The examination of the cost and volume data covers primarily the previous closed accounting period. Significant changes in, for example,

the cost data or traffic volumes may be taken into account in assessing the cost-oriented charges. The cost calculations for call termination on mobile networks are based on the replacement price of the mobile network which is used for determining depreciation. The replacement price is also used to define the capital employed in the network, i.e. the current replacement cost on which a return is calculated. In addition to the cost of capital, the estimate also takes account of the operating and overhead costs of the network. Figure 2 illustrates how the costs of interconnection traffic products are made up.

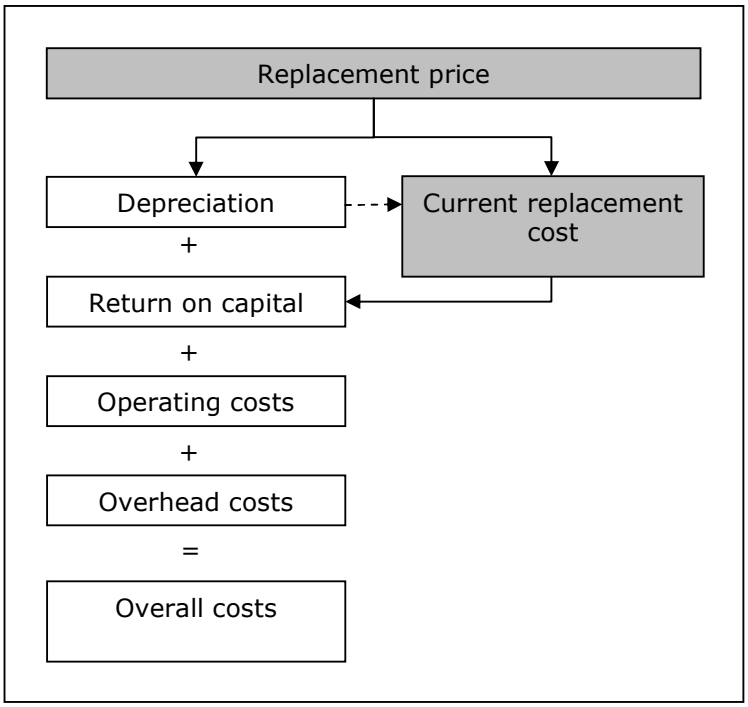

FIGURE 2 Cost structure

At this stage, FICORA considers it impractical to separate the costs of second and third generation networks from each other. FICORA recommends that the costs of third generation networks are included in the costs of second generation networks, and that these total costs are allocated to the entire traffic. This results in a common price for call termination on mobile networks.

4.1 Operating and overhead costs

Operating costs of a mobile network are comprised of the costs incurred by the use and maintenance of the network. These costs may include annual frequency and licence fees, rents on premises and mast sites, leased lines, material costs, labour and indirect employee costs, costs of network operations and maintenance, costs of network power, testing and development costs and other operating costs incurred by the use and maintenance of a mobile network. If a telecommunications operator does not have its own network but, for instance, leases network from other telecommunications operators, the costs incurred by this will be included in the operating costs. Intra-group charges for the use of a network must also be taken into account in accordance with the actual costs (only in operating costs). The operating costs must be based on the actual costs given in the operator's bookkeeping and cost-accounting.

It should be observed that operating costs do not include, for instance, termination fees payable to other operators, roaming costs or billing fees that belong to the service operator of a mobile network. The operating costs of a mobile network include only the operating costs incurred by mobile telecommunications (by a network operator).

It is also possible to allocate overhead costs for the entire company in mobile telecommunications to interconnection traffic products. The overhead costs are comprised of, for instance, costs incurred by the telecommunications operator's support activities, such as financial, personnel, data and materials administration. The telecommunications operator must also ensure that each cost

item of a product is allocated only once in order to prevent manifold allocations at company level. In addition, the cost volume must be taken into account in allocating the overhead costs. The share of the overhead costs from the interconnection traffic costs should not be significant but most of the costs should be allocated directly.

4.2 Replacement price of the mobile network

The value of the mobile network shall be estimated on the basis of the replacement price to calculate the depreciation and the capital employed. The replacement price shall be a sum of the replacement prices of different asset items of the network. Significant asset items in the network for assessing the mobile network include, for instance, base stations, centres, transmission connections between base stations and centres, and transmission connections between centres. In FICORA's FIFAC model the fixed assets are assessed at replacement price for the following asset items:

Asset item	**Description**
Base station subsystem	Base stations and radio repeaters; antenna systems and RF equipment; Base station controllers (BSC and RNC), software related to the controllers, measuring devices and the rest of the radio network
Transmission between base station controllers and mobile services switching centres	Transmission from BSC/RNC to MSC; Transcoder (TRAU)
Mobile services switching centres	Mobile services switching centres (MSC)
Transmission between mobile services switching centres	Transmission between MSCs
Interconnection links	Interconnection links to other networks
Voicemail systems	
Data service systems	SMSC; MMSC; Packet data systems (SGSN/GGSN and related transmission)
Other fixed assets in the network	AuC; EIR; network management systems; HLR; vehicles; all other fixed assets in the mobile network that cannot be allocated to other network elements
Intangible assets	

FICORA recommends that in assessing the network, the operator should primarily use the delivery prices the telecommunications operator would actually pay the equipment supplier (e.g. purchase agreements in force, offer requests). Thus, discounts on purchases should also be taken into account when the network is being reassessed. It should also be observed that asset items that have already been written off but are still in use must not be included in the replacement price. The assessment of the assets at replacement price must therefore be based on the operator's balance sheet, so the assets in the balance sheet shall be valued to replacement price.

If the telecommunications operator draws up the financial statement in accordance with the IFRS financial reporting standards and uses market values to assess property, the operator should report on the principles applied in the financial statement for assessing property and used in the pricing calculation. The share of labour costs can also be taken into account when estimating the replacement price of the network if the telecommunications operator has capitalised the share in the balance sheet in its accounts when making the investment. Otherwise, the share of costs as been taken into account in the calculations as operating costs.

The pricing calculation of the telecommunications operator shall include a calculation showing how the reassessment that is based on a replacement price has been done in practice and, if possible, provide the historical delivery prices of the asset items used in determining the replacement price. In other words, the pricing calculation shall explicitly indicate how the replacement prices have been determined.

So far, the replacement prices of mobile networks have been based on estimates provided by operators themselves. FICORA has not checked in detail whether the estimates are reliable and correct. However, FICORA has reason to doubt that the replacement prices presented by the opera-

tors contain inaccuracies. Since a significant portion of the costs of mobile telecommunications consists of return on capital and depreciation calculated by using the replacement price, estimation of asset items is a key factor for the correctness of the assessment of pricing. Therefore, FICORA shall, from now on, monitor more carefully how replacement prices are determined and comment, where necessary, on the accuracy of the methods used for determining the prices.

4.3 Depreciation

Depreciation is calculated on the basis of the replacement value of the network by using planned depreciation periods and methods in the statutory accounts. In the FIFAC model, depreciation is defined for the asset items mentioned in section 4.2.

4.4 Return on capital employed

The method FICORA has used to estimate the reasonable return is the WACC method (Weighted Average Cost of Capital), and the principles used for estimating the capital employed have mainly remained the same.

In 2005, FICORA commissioned Frontier Economics Ltd to prepare an expert report on the reasonable return on a mobile network (*Cost of capital for mobile telecommunications networks in Finland)*. To estimate the reasonable return, FICORA has also used the reports prepared by LTT-Tutkimus Oy (*Arvio kohtuullisesta pääoman tuotosta kiinteässä televerkkotoiminnassa)* and Europe Economics Ltd (*Cost accounting and Pricing Principles in Finnish Digital TV Transmission)*. Both reports have been published on FICORA's web page. Decisions made by other telecommunications authorities in EU countries have also been taken into account in the estimation of reasonable return in business operations related to mobile networks.

4.4.1 Definition of capital employed

The capital employed in mobile networks, on which the return is calculated, is comprised of the fixed assets in the network and other assets and debts related to the activities. Thus, capital employed may only include asset items employed in a mobile network. For instance, a company's losses from previous years or goodwill are not regarded as asset items necessary for producing call termination. They cannot therefore be included in the capital employed referred to in pricing calculations.

FICORA estimates the capital employed by using primarily the current replacement cost as the capital employed in fixed assets. The Supreme Administrative Court has confirmed the legality of the estimation method.[4] If reasonable, it is also possible to use some other method for defining the capital employed in fixed assets. The current replacement cost shall be determined by deducting the depreciation made on the basis of the replacement price and lifetime of the assets from the replacement price. The lifetime of the assets are those used in the operators' statutory accounts.

The current replacement cost of the whole network can be calculated by summing the current replacement costs of the network elements. A reasonable estimate of the current replacement cost of a network with moderate traffic volume growth can be calculated with the formula *NKA (current* replacement cost) = *JHH* $*$ *(n-1)/(2*n)* used by many telecommunication operators, where *JHH* is the replacement price and *n* is the average lifetime in years. The current replacement cost must be calculated with this formula, unless the telecommunication operator proves that it is reasonable to use a different formula that serves the purpose better than this method.

In addition to fixed assets, it is also possible to take such short-term assets and debts that have resulted from producing mobile telecommunications and call termination into account in the capital employed. The proportion of the short-term assets and debts from the capital employed should not be significant, but their order of mangitude should be appr. equal. Short-term assets and debts that belong to a mobile network are valued to balance sheet values of the period under review. In

[4] Decision of the Supreme Administrative Court on 16 September 2004, Diary no. 3225/2/02, Record no. 2323

future, FICORA shall investigate and comment on which short-term assets and debts may be included in the costs of call termination on mobile networks.

4.4.2 Reasonable return

In calculating a reasonable return, FICORA uses a percentage that has been determined with the average cost of capital, i.e. by using the so-called WACC method (Weighted Average Cost of Capital). In this method, the cost of the entire capital is the weighted average of the return requirements for both equity and debt. The weighting coefficient is the gearing of the operator, i.e. the debt percentage of the entire capital.

Concerning the paid tax rate, the pre-tax WACC is determined as follows:

$$WACC_{pre-tax} = D/V \times R_d + E/V \times R_e \times \left(\frac{1}{1-T} \right),$$

where D = amount of debt
E = amount of equity
$V = E + D$ entire capital
R_d = cost of debt
R_e = cost of equity and
T = company tax base.

4.4.2.1 Estimation of cost of debt

In practice, there are two ways to estimate the cost of debt using the WACC calculation: directly on the basis of the interests on the existing loans of the operator or by separately estimating the values for the risk free rate and the required debt premium. A common and more transparent alternative is to estimate the cost of debt on the basis of the separate components mentioned above. In addition, the cost of debt must be estimated uniformly for all the components included in the WACC calculation. Since the risk premium of an operator is partly determined by the operator's indebtedness, estimating the cost of debt on the basis of the actual paid rates would be in conflict with the use of target capital structure (see Gearing below). FICORA uses risk free rate and debt premium to estimate the cost of debt.

Risk Free Rate

The risk free rate indicates the return on a hypothetical risk free investment on the market.

FICORA considers it justified to use the return on long-term bonds (maturity of 5 or 10 years) as the indicator of the risk free rate. The risk free rate has usually been calculated by using bonds with a maturity of approximately 10 years. As the risk free rate, FICORA uses the Finnish reference loan rate for 10 years. At the time of quotation, FICORA uses the average from previous years February. The pre-defined time of quotation is clear and brought to the knowledge of all parties in advance. Thus, the risk free rate remains the same regardless of the time of the estimation. The risk free rate that has been defined this way is readily available, for example, on the web pages of the Bank of Finland, address www.bof.fi.

The average return on 10 year Finnish Government bonds was 3.44% in February 2006. FICORA will use this percentage as the risk free rate until the end of February 2007.

Debt Premium

A reasonable debt premium can be determined by the market values of the bonds that belong to operators with certain credit classification and are traded on the market.

Based on expert reports, FICORA uses 1.5% as the debt premium.

Cost of Debt

The cost of debt is the sum of the risk free rate and debt premium. Thus, on the basis of what is stated above, FICORA uses the percentage 5% as the cost of debt.

4.4.2.2 Estimation of cost of equity

In the WACC calculation, the cost of equity is estimated on the basis of risk free rate, market risk premium and beta coefficient.

Risk Free Rate

As stated above, the risk free rate used by FICORA is the average return on the 10 year Finnish Government bonds in February 2006, i.e. 3.44%.

Market Risk Premium

The general market risk premium indicates the average long-term excess return on risky investments in comparison with a risk free investment. The market risk premium is not dependent of a certain branch of business but indicates the general cost of risk on the market.

On the basis of historical averages, enquiries to professional investors, decisions made by other supervising authorities and expert reports, FICORA uses the percentage 4–5% as the general market risk premium.

Asset Beta

The beta coefficient indicates the market risk of a share. The market risk measures the sensitivity of a share to general changes on the market. Beta indicates the risk situation of an operator in relation to other investments. When the beta coefficient is 1, the risk of a share corresponds to the average market risk. The beta coefficient is the only risk indicator relevant to an investment decision.

When the WACC method is used, the operator's risks are taken into account in the beta coefficient.

FICORA has evaluated the beta for mobile telecommunications on the basis of, for example, expert reports and decisions made by authorities in other countries. The value of the asset beta used by FICORA in mobile telecommunications is 1.1-1.3.

Equity Beta

FICORA determines the beta used to calculate the cost of equity on the basis of asset beta and gearing of 30% (see Gearing below). Thus, the equity beta is 1.6-1.9.

Overall Cost of Equity

The cost of equity can be calculated by adding the market risk premium multiplied by the equity beta to the risk free rate. On the basis of what is stated above, FICORA uses the percentage 10-13% as the cost of equity.

4.4.2.3 Overall Average Cost of Capital

Gearing

The cost of an operator's total capital is calculated with the WACC method as a weighted average of the costs of equity and debt. The operator's gearing is used as the weighting coefficient which gives the debt percentage of the operator's entire capital.

In assessing the pricing of mobile operators' regulated products, FICORA uses the same return percentage or range of return for all operators. Therefore, the gearing applied in the WACC calculation should be the same ratio between debt and equity for all operators, and it is not possible, in practice, to use the actual capital structures in defining a reasonable return.

On the basis of expert reports, FICORA uses 30% as gearing in mobile telecommunications.

Tax Rate to Be Paid by Operators

FICORA takes the taxes paid into account in the cost of capital in accordance with the prevailing company tax base (currently 26%). In other words, FICORA uses the so-called pre-tax WACC for estimating the cost of capital. The cost of capital increases as taxes are taken into account.

4.4.2.4 Reasonable return on capital in mobile telecommunications

Based on what is stated above in sections 4.4.2.1-4.4.2.3, FICORA considers the return of **11-14%** to be reasonable in the pricing of call termination on mobile networks. The return requirements for mobile operators have not been otherwise restricted under the Communications Market Act.

TABLE 1 FICORA's WACC calculation for mobile telecommunications in Finland

	Low	High
Risk free rate	3.44%	3.44%
Debt premium	1.50%	1.50%
Cost of debt	3.94%	4.94%
Risk free rate	3.44%	3.44%
Market risk premium	4.00%	5.00%
Asset beta	1,1	1,3
Equity beta	1,57	1,86
Cost of equity	7.16%	9.14%
Gearing	30 %	30 %
Tax rate	26 %	26 %
WACC (pre tax)	**10.68%**	**13.52%**

5. ALLOCATION OF COSTS TO SERVICES

FICORA uses the FIFAC model to allocate the actual network costs to the services produced by operators. In accordance with the model, the operators' costs are first allocated to the main mobile network elements and then to each service in relation to the use of the network elements. The basic logic of the model corresponds to the network model FICORA has used before (at a more general level).

In the FIFAC model, the mobile network costs are allocated to different mobile network elements by means of allocation keys. The allocation keys are defined according to the nature of each cost item, and the costs are allocated according to the matching principle to different network elements. Examples of possible allocation keys are different network elements, number of personnel, floor area, vehicles, software and rents on connections. Mobile network costs are allocated according to allocation keys to different network elements which include base station subsystems, transmission between base station controllers and centres, mobile services switching centres, interconnection links, voicemail systems and common mobile network costs.

Costs are allocated to services on the basis of service volumes, and use and load. The services reviewed in the FIFAC model are call origination, call termination, on-net traffic, SMS origination, SMS termination, SMS on-net and packet data traffic. The use of service (routing) is reviewed by using weighting coefficients to illustrate how services in average use the network. Conversion and load factors, on the other hand, convert voice and data to a commensurable unit by taking the network load caused by the services into account. FICORA uses same weighting coefficients and conversion and load factors for all mobile network operators. The result of the model is a calculation of the unit costs of services and costs of services for different network elements.

FICORA's FIFAC model is available in pdf on FICORA's web page (in Finnish) at http://www.ficora.fi/index/saadokset/ohjeet/taloudellinenvalvonta.html .

6. EFFICIENCY

According to section 84 of the Communications Market Act, the efficiency of the operation must be taken into account in estimating the cost-oriented price in addition to the costs incurred and a reasonable return on capital. According to the legislative history of the act, the efficiency is assessed by comparing the costs incurred by producing the service with the costs incurred to other telecommunications operators operating in similar circumstances by providing a similar service.

The efficiency shall be assessed if there is reason to doubt the efficiency of the operation of the telecommunications operator. The efficiency of the operation may be questioned if, for instance, the charges collected by the telecommunications operator substantially exceed the general price level or if the cost items presented in the pricing calculation substantially exceed the costs reported by other telecommunications operators operating in similar circumstances. The efficiency is assessed individually for each case. In assessing the efficiency, FICORA does not approve costs that significantly exceed the costs incurred by efficient operation, determined on the basis of reference data, as the base for the pricing of regulated products. If the efficiency is to be assessed, FICORA makes a reference calculation for the regulated wholesale product, using costs it has approved.

7. REASONABLENESS OF PRICES

According to FICORA, it is possible to reliably determine a reasonable price level of call termination on mobile networks on the basis of the FIFAC model described above and the supporting assessment of efficiency that is based on cost comparison. In addition, the model can be used to assess differences between unit prices charged by operators as well as influence of traffic volume development on price differences. In assessing the reasonableness of call termination charges, it is also necessary to take account of the reciprocal nature of call termination and the influence of different pricing methods on the chances of network and service operators operating in fixed and mobile networks to compete with each other.

In its SMP analysis concerning call termination on mobile networks[5], FICORA has stated that the market for call termination on mobile networks works in such a way that each mobile network operator must make their pricing decisions by taking account of the chances of competitors providing a reciprocal service to react to the pricing with their own interconnection prices. In Finland, mobile network operators negotiate the prices for call termination among themselves, and other actors, namely regulated fixed network operators and foreign telecommunications operators, are practically price takers.

Mobile operators' pricing of call termination has a direct effect especially on the end customer prices for calls made from fixed networks to mobile networks. Prices for call termination on fixed networks are significantly lower than prices for call termination on mobile networks. Therefore, prices for calls made from a fixed network to a mobile network are high in comparison with prices for calls made from a mobile network to another, from a mobile network to a fixed network or from a fixed network to another. Bringing the prices for call termination on mobile networks to a cost-oriented and reasonable level makes it possible to reduce the retail prices for calls made from fixed networks to mobile networks. In addition, lower prices reduce price distortion between regulated call termination compensation and retail prices for mobile services. The retail price charged to users and consumers of mobile communications services has in many cases been lower than the price operators charge each other for call termination.

In addition to the general price level of call termination on mobile networks, differences between mobile network operators' prices for call termination affect the competitive situation on mobile markets. The most important customers of every mobile network operator in Finland are other Finnish mobile network operators, and so a significant part of the total traffic consists of minutes these operators charge each other for two-way traffic. In 2005, approximately 68% of the traffic terminating on Finnish mobile networks came from other Finnish mobile networks, approximately 22% from Finnish fixed networks, and less than 10% from other networks. In 2005, the total value of call termination on mobile networks exceeded 450 million euros. Thus, even small changes in the prices for call termination between operators affect the net income and expenditure by millions of euros.

It is important to reduce the differences in the prices for call termination on mobile networks in order to ensure equal competitive conditions for mobile operators. Because of reciprocal interconnection traffic pricing, mobile operators that have charged higher prices for call termination have introduced such mobile subscriptions on the market which entitle the end customer to compensation in money or some other compensation. By doing this, operators have tried to increase their demand for call termination. Mobile operators charging lower prices for call termination have not been able to cost-effectively introduce similar subscriptions on the market. In addition, operators charging higher prices for call termination than other operators may subsidise the retail prices for calls made from their network since they earn more income from calls received by their network than from calls made from the network.

FICORA finds it necessary to give a view on the development in prices in order to bring the prices for call termination to a reasonable level. For this purpose, FICORA publishes the appended view on the development of prices up to year 2009. FICORA's estimate of a reasonable price level is based on cost and volume data collected from mobile operators and on the reciprocal nature of the call termination market. FICORA's goal is to support commercial negotiations between operators, with the aim of lowering the price level of call termination and reducing price differences in call termination between operators. The purpose of this is to promote competition in the telecommunications markets.

FICORA considers that, in addition to promoting competition in the field, the view on the future price level shall increase the transparency and predictability of the monitoring of call termination charges. The promotion of transparency and predictability and the reduction of price differences in call termination are the most effective means to motivate operators to increase their customer volumes, since the reached additional volumes do not have a direct effect on the unit price for call termination. If changes in the pricing of call termination would be based on changes in traffic volumes between mobile operators, the operators would not have similar incentives to increase their

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5 http://www.ficora.fi/attachments/suomi_hmv/1158761635234/Files/CurrentFile/M16_perustelumuistio.pdf (in Finnish)

customer volumes. In a similar situation, a smaller operator may compensate its smaller volumes by charging significantly higher termination prices than other operators, and, on the other hand, it may not be profitable for a larger operator to try to strengthen its market position, because it would increase the differences in prices for call termination. FICORA updates its estimate of a reasonable price level at least once a year. The estimation is based on cost and volume data collected from operators and market development.

FICORA considers that it is reasonable to bring the prices for call termination to cost-oriented level gradually, since rapid significant changes in price level and price differences between operators may have harmful effects on the efficiency of the market. In addition, it is not reasonable to obligate network operators that have entered the market later than others to have the same price level of call termination as the operators that have entered the market earlier, since the more recent entrants have clearly higher unit costs at the early stage of the operation than operators that have been active in the field for a longer period. Thus, price differences should also be reduced gradually.

FICORA's view presented in the appendix is meant for the assessment of the reasonableness of call termination charges collected by network operators already active on the market. If a new mobile network operator would enter the market, it would be necessary to analyse the market and the need for SMP obligations separately for this new operator.

8. SUMMARY

Interconnection between operators is a primary requirement for operators to enable their end customers communicate with subscribers connected to another network. It is important that mobile termination prices are reasonable to ensure that communications networks and services are available under reasonable conditions to all operators and users. By its prior decisions FICORA has required that the three nationwide mobile operators (Sonera, Elisa and DNA) apply non-discriminatory and cost-oriented terms for mobile termination. In assessing whether or not the operators apply reasonable prices, FICORA takes into consideration the operator-specific costs incurred by producing the service, as provided in the Communications Market Act.

With some examples FICORA has assessed DNA's, Elisa's and Sonera's mobile termination prices based on the operators' cost and volume data for 2005 and with the help of the FIFAC model. As there have been some significant changes in the market, FICORA has also assessed the prices of these operators for the realised traffic volume during the first six months in 2006 and for the estimated traffic volume for the rest of 2006.

On the basis of this assessment FICORA regards that current mobile termination prices are too high in relation to costs. According to FICORA's assessment, structural changes in the market and changes in traffic volume in 2006 are facts that must be considered in cost-oriented prices. General growth in traffic volume lowers the unit costs for mobile termination and thereby has an impact on the price level. Lower prices are important particularly because the operators' pricing of mobile termination has a direct impact on end user prices for calls made from fixed networks to mobile networks.

This assessment indicates that changes in the mobile network operators' traffic volume have an impact on interconnection price differences among the operators. As interconnection between mobile networks is, by nature, a reciprocal service between the operators, the big differences in the operators' mobile termination prices may distort competition in the end user market. Therefore, FICORA regards it important that there should be a decrease in price level and operators' mobile termination prices should approach each other.

In order to support the negotiations between the operators, FICORA has drawn up the annexed assessment regarding future development of mobile termination prices and how they can be brought to a reasonable level. FICORA's aim is to support the commercial negotiations so that the price level of call termination decreases and that price differences among the operators become smaller. These measures seek to promote competition in the field.

FICORA follows regularly the data of the mobile network operators' costs and traffic volume as well as development in the market. According to section 126 of the Communications Market Act, FICORA shall promote cooperation among telecommunications operators and aim at resolving disputes between telecommunications operators primarily through mediation. Therefore, FICORA advises that mobile network operators agree on call termination prices primarily in their commercial negotiations with regard to FICORA's assessments and principles.

ANNEX 1 FICORA'S VIEW ON THE DEVELOPMENT OF MOBILE TERMINATION PRICES

FICORA regards that its view on the development of mobile termination prices is needed in order to bring the prices to a reasonable level. Therefore, FICORA publishes its view reaching up to 2009. This assessment about reasonable price level is based on cost and volume data collected from the mobile operators during 2005 and 2006 as well as on the reciprocal nature of the call termination market. FICORA has used the FIFAC model in the assessment of cost-oriented prices. Smaller price differences are also taken into consideration as they are important to ensure equal competition among mobile network operators.

FICORA regards that it is motivated to decrease call termination prices to a cost-oriented level gradually, as fast and significant changes in the price level and in price differences among operators may cause harmful effects on the market.

FICORA wishes that mobile network operators agree on call termination prices primarily in their commercial negotiations. The aim of this view is to support the commercial negotiations so that the agreed prices would promote competition in the field. As the negotiations between the mobile network operators are not yet finished, FICORA has drawn up two alternative opinions on the development of prices. Alternative 1 is FICORA's view on reasonable price level, if all mobile network operators agree on call termination prices. If, however, consensus is not reached in the negotiations, it is motivated to start applying lower price level, according to alternative 2.

FICORA's view is that mobile termination prices should develop according to the alternatives given below. The tables indicate FICORA's view on the minimum and maximum prices. Mobile network operators may freely agree on any price between these figures. The final prices are therefore defined by the mobile network operators.

Alternative 1:

Mobile termination price (cents/minute)	Current level	Year 2007	Year 2008	Year 2009
Minimum	6,8	6,5	5	3,5
Maximum	10	8,2	6	4

Alternative 2:

Mobile termination price (cents/minute)	Current level	Year 2007	Year 2008	Year 2009
Minimum	6,8	5	4	3,5
Maximum	10	6,5	5	4

FICORA follows regularly the mobile network operators' cost and volume data as well as the development on the market. The view on a reasonable price level is updated accordingly.