



ASSESSMENT PRINCIPLES FOR THE PRICING OF DIGITAL TV TRANSMISSION SERVICES

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1. SCOPE OF APPLICATION AND GENERAL PRINCIPLES FOR THE PRICING OF DIGITAL TV TRANSMISSION SERVICES

FICORA has imposed Cost-orientation and non-discriminatory obligations on pricing in the market for TV transmission services. These obligations are included in the firm-specific decision on significant market power (SMP)¹. Digita Oy (hereafter Digita) is currently the only operator providing regulated terrestrial TV transmission services in Finland. According to the decision Digita must specify the prices charged for digital multiplexing services, and transfer and transmitter network services needed for the transmission of programmes in a way that the pricing is cost-oriented and non-discriminatory. Similarly, national radio network service pricing must be cost-oriented and non-discriminatory.

The pricing obligation in the SMP decision on digital TV transmission services concerns the prices the firm charges for multiplexing services, transfer services and transmitter services needed for the transmission of programmes. The general principles in this memorandum concern the cost-orientation assessment of pricing of digital TV transmission and pricing calculations. In addition to digital TV transmission services, national analogue television and radio transmission services are subject to regulation. The general principles in this memorandum also concern, as applicable, other regulated transmission services.

According to section 84 of the Communications Market Act, a cost-oriented price means that a price is reasonable considering the costs incurred and the efficiency of the operation. In assessing reasonableness, regard must also be paid to a reasonable return on capital employed, which is affected by the investment of the firm and related risks.

In assessing the pricing, FICORA examines the firm's operational costs incurred on the basis of information from the previous financial period. It is peculiar to digital TV transmission services that the agreements of network firms and programme service firms providing transmission services are mainly made for several years. In addition, the capacity to be used, transmission power, transmission time and transmission area are taken into account in pricing. In assessing case-specific pricing, it may be necessary to assess the cost-orientation of pricing both at the time of the agreement and in the light of the current costs. In case-specific assessment, FICORA takes into account the characteristics of the market for transmission services.

2. PRICING CALCULATIONS

According to section 86 of the Communications Market Act, a telecommunications firm has an obligation to prove that the price charged is cost-oriented and non-discriminatory when a pricing matter is being handled by FICORA. Digita is a telecommunications operator referred to in the law.

At request, a telecommunications operator must submit to FICORA up-to-date and sufficiently detailed pricing calculations based on the prices the operator charges for products subject to regulation. FICORA assesses the legality of the pricing of the telecommunications operator primarily on the basis of these calculations. However, FICORA's assessment is not bound to the cost and pricing calculation principles used by the telecom operator. FICORA assesses the legality of digital TV transmission services according to the principles described in this memorandum.

A telecommunications operator obliged to charge cost-oriented prices must make product-specific pricing calculations prior to determining or changing the prices of regulated products. The pricing calculations must be based on the operator's cost-accounting data and accounting data. The prices of regulated products must be set on the basis of these calculations. If the obligation to use cost-accounting procedures has been imposed on a telecommunications operator, there must be a clear connection between the cost-accounting and the pricing calculations. The auditors of the operator must find and verify the connection when examining cost-accounts.

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FICORA recommends that telecom operators follow the principles described in the memorandum in their pricing calculations. A telecom operator may use other calculation methods for a justified reason. A telecom operator must then show that it is well-founded to use them in the individual case in question and that the outcome does not essentially differ from that of the recommended calculation methods in this memorandum.

3. NETWORK STRUCTURE

The primary functional properties needed to implement digital TV transmission services can be divided into 1) multiplexing services 2) transfer services and 3) transmitter network services (see figure 1 below). Network monitoring and control concern all these stages of the service chain. Multiplexing services consist of packing the material into multiplexes to be broadcast. In order to be able to transmit programs regionally, multiplexing can also be done regionally (remultiplexing). Transfer network services consist of sending programmes to transmitting stations. The transfer can be implemented via optical fibre cables or radio link network. Transmitter network service means transmitting programmes to be received by end-users. Multiplexed programmes are transmitted to transmitter station -based towers to be eventually received by viewers via antennas.

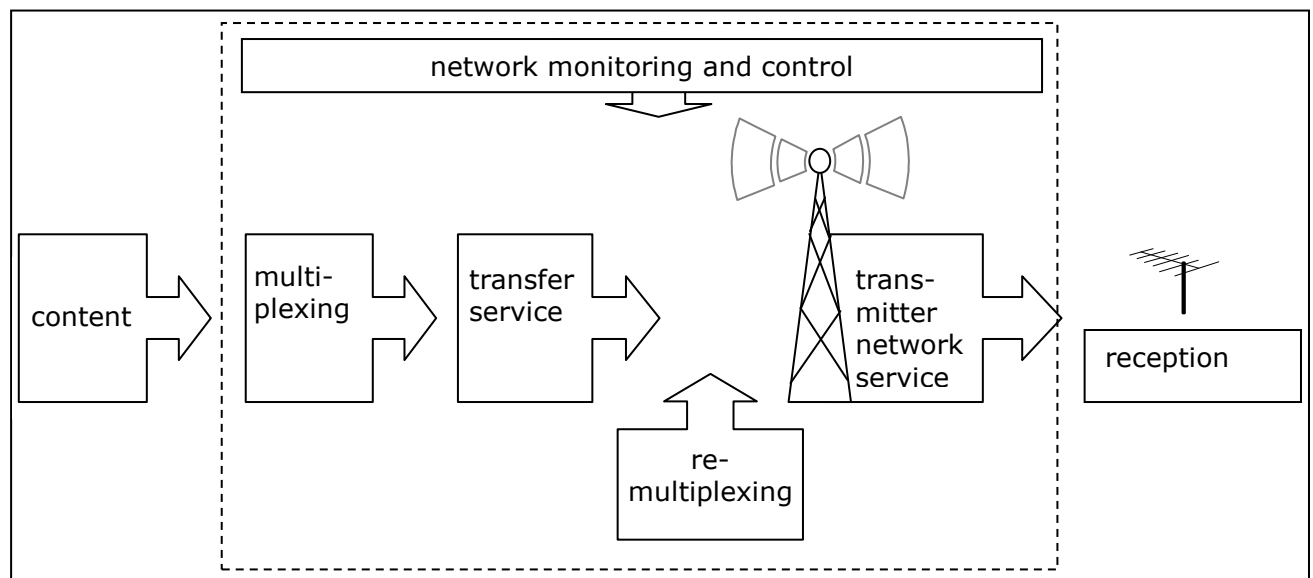


Figure 1 The basic structure of the digital television transmission network

4. COST ITEMS INCLUDED IN THE CALCULATIONS

The starting point for the cost calculations when assessing the cost-orientation of prices charged for digital TV transmission services is to assess the replacement price of the digital TV transmission network, which is used for determining depreciation. The replacement price is also used to define the capital employed in the network, i.e. current replacement cost on which return is calculated. In addition to the cost of capital, the estimate also takes into account the operating costs, such as the operating and common costs of the network. Figure 2 illustrates how the costs of digital TV transmission services are constructed.

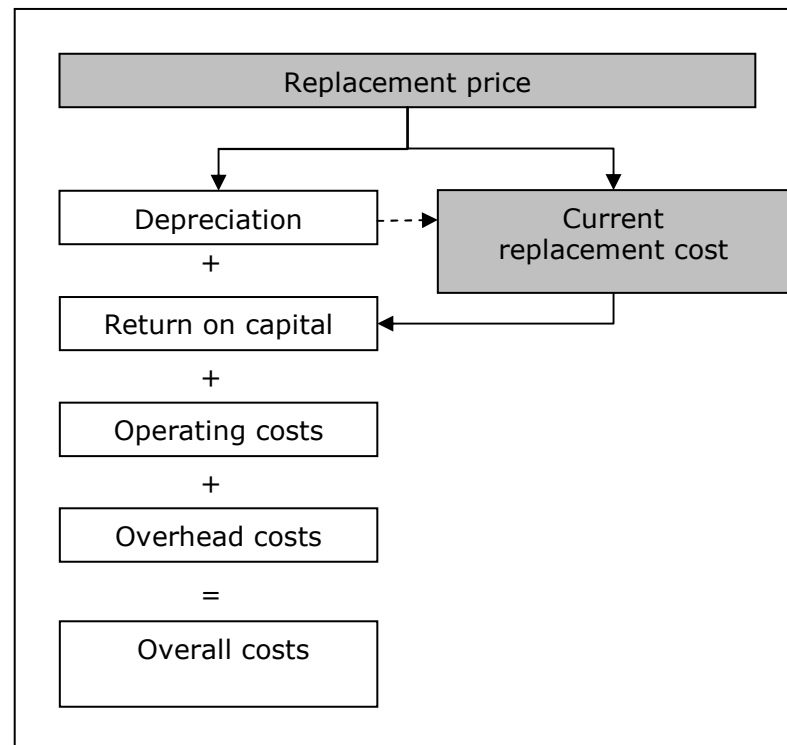


Figure 2 Cost structure

4.1 Replacement price

The value of the TV transmission 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 elements of the network. Examples of network assets significant for the assessment of the network are: stations, masts, antennas, feed cables, transmitters and power supply and cooling system units. Assets belonging to the digital TV-transmission network are also network management systems (including measuring equipment), encoding and multiplexing equipment and transfer network systems. The replacement prices of all relevant network elements and clarifications of assessment determination must become evident in the replacement price calculations. The network must be assessed by primarily using the charges collected by equipment suppliers that the telecommunications operator would actually pay the equipment supplier (e.g. purchase agreements in force, invitations for bids). Thus, reductions from purchases should be taken into account when reassessing the network. Asset items that have already been entirely removed, but are still in use must not be included in the replacement price. The assessment of the replacement price of the infrastructure should thus be founded on the operator's balance sheet, i.e. the assets in the balance sheet shall be valued to replacement price.

If the telecommunications operator draws up a financial statement in accordance with the IFRS financial reporting standards and uses market values to assess the infrastructure, the operator should report what sort of the principles have been used in the financial statement for assessing the infrastructure and how these have been applied to the pricing calculation. The share of labour

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 labour has been included in the calculations as operating costs.

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

4.2 Depreciation

Depreciation is calculated on the basis of the replacement price value of the network by using depreciation times and procedures that accord with the accounting plan. Using the depreciation times as planned promotes the transparency and authentication of the calculation.

4.3 Return on capital employed

The general principles and methods used in FICORA's assessment for reasonable return are mainly suitable for the assessment of reasonable return on capital employed of digital TV transmission services². On 28 June 2006, FICORA has given out assessment principles for the pricing of fixed network interconnection traffic³ and on 7 December 2006, FICORA released assessment principles for the pricing of call termination on mobile networks⁴.

In the memorandums FICORA has assessed the parameters of the WACC method and defined the range of variation for return it regards reasonable for fixed telecommunications and mobile network operations.

4.3.1 Definition of capital employed

Capital employed is defined by assessing the value of the infrastructure needed for carrying out digital TV transmission services. FICORA estimates the capital employed by primarily using the current replacement cost as capital employed in fixed assets. The Supreme Administrative Court has confirmed the legality of the assessment method⁵. If justified, it is also possible to use another method for defining the capital employed in fixed assets. The current replacement cost is 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 entire 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 can be calculated using the formula $NKA \text{ (current replacement cost)} = JHH * (n-1)/(2*n)$ used by many telecommunication operators, where JHH is the replacement price and n is the service life in years. The current replacement cost shall be calculated by using this formula, unless the telecommunication company demonstrates that another formula is more suitable for the purpose.

² In 2005, FICORA commissioned an expert survey at Europe Economics Ltd on the reasonable return on TV transmission services: http://www.ficora.fi/suomi/document/Report_for_publication.pdf

³

http://www.ficora.fi/attachments/englanti/5kMzGtLBs/Files/CurrentFile/KiinteanVerkonArviointiperiaatemuisti_oEN.pdf

⁴

http://www.ficora.fi/attachments/englanti/5n14UxXtj/Files/CurrentFile/Arviointiperiaatemuistio061207MobiiliE_N.pdf

⁵ The Supreme Administrative Court's decision of 16 September 2004, Reg.no. 3225/2/02, label 2323

4.3.2 Reasonable return

Digita is obliged to specify the prices charged for digital multiplexing services and transfer and transmitter network services needed for the transmission of programmes, in a way that the pricing is cost-oriented and non-discriminatory. Similarly, prices for corresponding national radio network service must be cost-oriented and non-discriminatory.

According to section 84 of the Communications Market Act, in assessing reasonableness, a reasonable return on capital, which is affected by the investment of the telecommunications operator and related risks, shall also be taken into account.

When assessing reasonable return, FICORA uses a percentage based on the average cost of capital, i.e. the so-called WACC method (Weighted Average Cost of Capital). The WACC method is an established calculation method of cost of capital used in different sectors. Plenty of reference material of WACC is readily available.

In order to support its assessment, FICORA commissioned Europe Economics Ltd to carry out a survey on the WACC figures suitable for assessing reasonable return on regulated terrestrial transmission services, and their assessment criteria. FICORA has also taken into account, as applicable, the WACC surveys commissioned to Frontier Economics Ltd and LTT-Tutkimus Oy. The WACC survey by Frontier Economics concerned return on capital in mobile network operations and the survey by LTT-Tutkimus Oy concerned return on capital in fixed telecommunications operations.

In this method, the cost of the entire capital consists of the weighted average of the return requirements for both equity and debt. The weighting coefficient is the gearing of the operator, i.e. the percentual share of the debt from the entire capital employed. When paid taxes are included in the WACC determination, the pre-tax WACC is determined as follows:

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

- where
- D = amount of debt
 - E = amount of equity
 - V = $E + D$, i.e. entire capital
 - R_d = cost of debt
 - R_e = cost of equity
= risk-free rate + beta * market risk premium,
 - T = company tax base

4.3.2.1 Gearing level

According to the WACC method, the operator's cost of total capital is calculated as weighted average of the costs of equity and debt. The operator's gearing is used as the weighting coefficient which gives the percentual share of the debt from the operator's entire capital.

The WACC calculation may either be founded on the operators' true capital structure or target-oriented capital structure. The operators' actual debt rates can fluctuate considerably within a span of few years. In its assessment of reasonable return, FICORA uses target capital structure, which increases the predictability of monitoring and encourages firms to be efficient in their choice of capital structure.

Relying on reports of experts, FICORA recommends that the gearing in digital transmission network services be 30%.

4.3.2.2 Estimation of cost of debt

In the WACC calculation, there are two ways how to estimate the cost of debt: on the basis of the interests on the firm's current loans or by separately estimating the values for a risk-free rate and debt premium. In addition, the cost of debt must be estimated uniformly for all the constituents of the WACC calculation. Since FICORA uses target capital structure, it would be inconsistent to define debt on the basis of actual interest. In addition, it is a commonly-used and transparent alternative to define the cost of debt on the basis of different constituents. Thus, FICORA uses a risk-free rate and debt premium when it assesses the cost of a firm's 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. Generally, bonds of 10-year maturity have been used in order to calculate the risk-free rate. FICORA recommends that the Finnish government reference loan rate for 10 years be used as the risk free rate. At the time of quotation, FICORA uses the average from previous 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 estimation. Thus, the defined risk-free rate is readily available, for example, at the Bank of Finland website at www.bof.fi.

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

Debt Premium

A reasonable debt premium can be derived from the market interest of bonds owned by firms subject to public trade in the market and who belong to a certain credit classification.

Since the regulated firm is not listed, it has no public credit classification. FICORA has requested the credit classification of the firm and the sector from a firm specialised in analysing credit classifications⁶. Based on expert estimates, FICORA uses the debt premium of 0.5 at the most.

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 recommends the cost of debt is 4 % at the most.

4.3.2.3 Definition of equity cost of capital

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 %.

⁶ Suomen Asiakastieto Oy 13.12.2006

Market risk premium

The general market risk premium indicates the average long-term excess return on risky investments in comparison to risk-free investments. A market risk premium is not branch-dependent, but indicates the general cost of risk on the market.

On the basis of historical averages, surveys to professional investors, decisions made by other supervisory authorities and expert estimates, FICORA uses the percentage 5 % as the general market risk premium.

Asset beta

A beta coefficient indicates the market risk of a share. The market risk measures the sensitivity of a share to general changes on the market. A beta indicates the risk situation of an operator in relation to other investments. An asset beta leaves out the risk involved with the firm's debt. With the beta coefficient being 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.

In case of the firm is listed at the stock exchange, asset beta may be calculated directly to the firm. There are no listed firms in the Finnish market for digital transmission services, so it is not possible to calculate asset beta directly. Asset beta can be assessed by comparing it to the beta of firms within the same branch. Commissioned by FICORA, Europe Economics Ltd carried out an expert survey on Digita's return on capital. In the survey, Digita is paralleled by public utilities, such as firms in water, electricity and gas business. In FICORA's opinion, the riskiness of their business cannot directly be compared to that of Digita's.

FICORA has examined the asset betas of mast and network firms providing TV transmission services and compared them to the expert beta assessments made of similar branches, such as fixed telecommunications network business and mobile communications business.

Based on these surveys and comparisons, FICORA has decided to use an asset beta of 0.9 for digital transmission services.

Equity Beta

FICORA recommends that a beta used for calculating the cost of equity be determined on the basis of an asset beta and gearing of 30 % (asset beta/[1-gearing level]). Thus, the equity beta for Digita is 1.3.

Illiquidity premium

It has been suggested that in some cases, an illiquidity premium should be added on the equity cost of capital of unlisted firms. The illiquidity premium is based on a thought that share transaction costs of unlisted firms can be greater than those of listed firms.

FICORA uses target capital structure for assessing reasonable return. Eventual expenses from illiquidity such as this will be excluded.

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 interest. Thus, on the basis of what is stated above, FICORA recommends that the cost of equity to be used is 10 % at the most.

4.3.2.4 Tax to be paid by firms

FICORA recommends that the paid tax is included in the cost of capital in accordance with the corporate tax rate in force (26 % at the moment). The inclusion of taxes increases the cost of equity. In other words, FICORA recommends that the so-called pre-tax WACC be used in order to determine the cost of equity.

4.3.2.5 Reasonable return on capital employed in transmission services

On the basis of this, FICORA maintains that 11 % is reasonable return in the pricing of digital TV transmission services.

Risk-free rate	3,44 %
Debt premium	0,50 %
Cost of debt	3,94 %
Risk-free rate	3,44 %
Market risk premium	5,00 %
Asset beta	0,9
Equity beta	1,29
Cost of equity	9,87 %
Gearing	30 %
Tax	26 %
WACC (pre-tax)	10,52 %

Table 1 FICORA's WACC calculation for digital TV transmission services in Finland ⁷.

4.4 Operating and overhead costs

Operating costs consist of the costs incurred from the use and maintenance of the digital TV transmission network. Examples of these are material costs, labour and indirect employee costs, rents on premises, costs of the use and maintenance of a network control system, operating costs of power and condenser units, testing and development costs and other operating costs regarding the use and maintenance of the network. The operating costs must be based on the realized accounting and cost-accounting information of the telecommunications operator.

The overhead costs consist of, for example, the costs incurred from the telecommunications operator's support activities, such as financial, personnel and data administration and materials management. The telecommunications operator must also ensure that each cost item of a product is allocated only once in order to prevent manifold allocations at corporate level. In addition, the cost volume must be taken into account in allocating the common costs. The share of the overhead costs over the digital TV transmission costs should not be significant, but it should be possible to allocate most of the costs directly.

⁷ The risk-free rate to be used in the calculation is the average return on the 10-year Finnish Government bonds in February. The calculation will be revised, if any significant changes in the weighted average cost of capital (WACC) occurs.

5. ATTRIBUTION OF COSTS FOR REGULATED PRODUCTS

The costs of digital TV transmission services consist of the costs incurred from multiplexing, shared infrastructure, high-powered transmission and network control. The cost and capacity data is primarily assessed on the basis of the previous closed financial period, which is compared to the current price of digital capacity.

Multiplexing and transfer

Costs incurred from fibre and link networks are equity and operating costs related to transfer networks. Cost shall be allocated to customers on the basis of realised costs. Costs incurred from encoding and multiplexing equipments are equity and operating costs related to multiplexing.

Shared infrastructure

A considerable share of the capital funds needed for producing digital TV transmission services is also used for the production of several other services. Typical examples of shared infrastructure are main transmitter stations and their masts and equipment in shared usage at transmitter stations. The costs of shared infrastructure can be allocated to the transmitters in use on the basis of their power classes, for example.

Some products made by using the shared infrastructure may be regulated and some may be unregulated. That is why the use of applicable allocation principles in the division of equity and operating costs is emphasized in the assessment of transmission service costs. To ensure that there is no cross-subsidy between regulated and unregulated products, it is important, when examining regulated products and their pricing, to define the interfaces of regulated products in a clear and transparent manner so that they are distinct from other activities and to separate their costs from one another. The variation of the number of shared infrastructure distributors must affect the amount of costs allocated to the users of shared infrastructure.

High-powered transmission

Equity and operating costs related to direct transmission include the costs incurred from actual television transmitters, sub-transmitters and antenna systems and peripherals needed for broadcasting. Costs shall be allocated to customers and transmitters on the basis of realised costs.

Network management and control, technical guidance

The share of costs related to network management and technical guidance belonging to digital transmission services is allocated per customer in accordance with the realization data. Costs related to network management and personnel are included in the overall costs of transmission, transfer and multiplexing.

Table 2 shows an example of the assessment calculation of the pricing of digital TV transmission services. The calculation is a summary of the costs of the digital TV transmission network. A case-specific assessment requires an overall picture of the costs. However, the case-specific assessments to be submitted to FICORA must be more detailed than the example below. The calculations of the telecommunications operator must include detailed data on what the replacement price of the network consists of as stated in the section above, on the used depreciation procedure and depreciation times by different network elements, on how the capital employed has been determined, and on what the operating and overhead costs consist of. In addition, the clarifications must report the principles employed in allocating the costs. The cost calculations made by the telecommunications operator and the charges collected by the operator must clearly correspond to each other.

TOTAL COSTS OF DIGITAL TV TRANSMISSION SERVICES		
Replacement price of network elements in TV transmission network	a_i	
Depreciation time	b_i	
Depreciation	$c = \sum(a_i/b_i)$	
Total capital employed (current replacement cost) i.e. total capital employed of network elements	$d = \sum(a_i * (b_i - 1) / (b_i * 2))$	
Return on capital employed	(e)	
Return on capital	$(f = d * e)$	
Operating costs	(g)	
Overhead costs	(h)	
Total costs of the entire TV transmission network	$(c + f + g + h)$	
Costs of attributed digital TV transmission services		

COSTS OF SHARED INFRASTRUCTURE					
		Digital TV broadcasting	Other		
Shared transmitter network service infrastructure					
	Operating costs				
	Overhead costs				
	Cost of capital				
	• depreciation				
	• return on capital				
Total costs					
ATTRIBUTION OF COSTS FOR REGULATED PRODUCTS					
		Regulated			Other
		MUX A	MUX B	MUX C	
Multiplexing services ^{*)}					
	Operating costs				
	Overhead costs				
	Cost of capital				
	• depreciation				
	• return on capital				
Transmission service ^{*)}					
	Operating costs				
	Overhead costs				
	Cost of capital				
	• depreciation				
	• return on capital				
Transmission network service ^{*)**)}					
	Operating costs				
	Overhead costs				
	Cost of capital				
	• depreciation				
	• return on capital				
Total costs					
Alltime price of capacity/ 21 Mbit/s					
*) include costs of network monitoring and control					
**) include costs of shared infrastructure					

Table 2 An example of the assessment calculation of the pricing of TV transmission services

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 telecommunications operator. 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 assessed, FICORA provides the regulated wholesale product with a reference calculation using costs it has approved.