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STRATEGIC MANAGEMENT ACCOUNTING IN THE FUNCTION OF OPERATOR PRICE REGULATION

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Abstract: *The paper discusses the functional relationship between strategic management accounting and the pricing of services that are under the control of the regulator. This is a part of the public sector in which the prices of services are not formed freely, because in these markets there is a significant market power of one or more participants. Therefore, there is a discriminatory attitude towards the competition but also the impact on end consumers, narrowing their choice between multiple services. Consumers are directed to certain prices, which include extra profits, although this should not be the case. This phenomenon is characteristic of the field of electronic communications and similar network sectors and can be prevented by modern methods available to strategic management accounting, primarily by different types of cost models. Prices should be based on the cost of providing services, and a strategic approach to billing in this case is provided by the regulator, as these are monopolized markets. The paper will test the hypothesis that cost models affect the reduction of service prices on the example of wholesale prices in fixed and mobile telephony in the Republic of Serbia.*

Keywords: *strategic management accounting, regulated prices, cost models, fixed network termination price, mobile network termination price.*

INTRODUCTION

Management accounting, as a set of procedures and methods of analysis of internal and external financial data for the purpose of making management decisions, in modern business conditions has acquired a strategic dimension. This implies the use of all data provided by conventional management accounting for business decisions, but focused on: market, customers, marketing, competitive products and services and analysis of the market position of the company (Milicevic, 2003:7). The customer is the focus of all production and service processes, which are becoming increasingly global. One of the most important business decisions is to form a competitive price for a product or service. Such a decision is influenced by many factors, and the basic calculation is the cost of a specific product or service. The emphasis is on reducing the cost price throughout the value chain, managing all internal and external costs. This is especially caused by the rapid technical and technological development, the expansion of the service sector and the opening of public companies for market competition in the field of telecommunications,

transport, energy (Malinic i dr. 2013:35-39). Liberalization of the mentioned sectors should be done strategically, through national regulatory bodies for these areas, because these public companies are natural monopolists on the market.

Profits are the goal of all business processes, which in conditions of free competition do not have a direct proportional relationship with the price of services. High prices do not have to mean high profits if demand is not high. A better option is to lower the cost price and achieve a reasonable margin, which can provide a competitive advantage in the market. In markets where there is no competition, pricing policy is most often based on extra profits and the spillover of costs between different products and services of the same company, which has negative consequences for both end consumers and other market participants. These problems can be solved by strategic management accounting, thanks to modern cost models: Historical Cost Accounting (HCA), Current Cost Accounting (CCA) and Long Run Incremental Cost (LRIC), with accompanying methods of cost allocation Top-down or Bottom-up (Courcoubetis and Weber, 2003: 111-191). These models and methods have found special application in the field of electronic communications, where they are incorporated into European legislation governing this sector, and further implemented in the national legislation of EU member states or candidate countries, such as the Republic of Serbia (Matavulj, 2021.). They are based on the concept of Activity Based Costing (ABC), where activities are the main drivers of costs (Kaplan, 1998), (Daly, 2002), (Stevanovic, 2008, 2013).

The central part of the EU regulatory framework for electronic communications is the concept of SMP (Significant Market Power) operators because they are monopolized markets. In the last 20 years, the regulatory framework for electronic communications has changed several times, as well as the number of relevant markets, and in the last few years it has been reduced to four wholesale markets that are subject to regulation. With the introduction of regulation in this area, the regulator has created conditions as if competition exists.

In the Republic of Serbia, the electronic communications sector has been regulated since 2005, and since 2010 the market has been analyzed according to European guidelines for this area and prices have been regulated based on modern cost models. The Law on Electronic Communications (Official Gazette of RS, 44/10) and three rulebooks on the cost principle (Official Gazette of RS, 103/08, 52/11 and 53/21) incorporate European regulations and practices, coordinated by the Body of European Regulators for Electronic Communications (BEREC). European regulations are based on the achievements of strategic management accounting, both in terms of market analysis under regulation (EC, C 2002/C 165/03) and the calculation of regulated prices of services in general (EP and Council, 2005/698 EC),

and in terms of regulation of prices of mobile and fixed termination services (EC, 2009/396).

In the Republic of Serbia, the ABC concept has been adopted for large companies, while smaller companies can directly apply the FDC concept (Full Distributed Costs), separating general costs from cost centers to services through cost drivers (Matavulj, Milicevic, 2008). The FDC concept corresponds to the Top-down cost method, in which costs are allocated to services using existing accounting data, via the HCA or CCA cost model.

Without going into the details of the regulation and the nature of each of the markets, attention will be focused on the practical use (by the regulator) of the achievements of strategic management accounting in regulating the prices of services of SMP operators. The hypothesis that cost models, going through their development phases, lead to a gradual reduction in the prices of regulated services will be tested. The hypothesis was tested on two types of wholesale services of SMP operators - call termination in their fixed and mobile network.

After the introduction, the second part of the paper presents the basic settings of cost models and their development phases in the Republic of Serbia. In the third part of the paper, the mentioned hypothesis is tested, using a comparative analysis of data on prices of call termination services in the fixed network of operators. The fourth part of the paper is dedicated to testing the hypothesis for call termination service in the mobile network of the SMP operator. For both services, specific decisions of regulators in the last a few years are analyzed, when (or not) different cost models were used. At the same time, a comparison is made with the European averages of these prices by years, published by BEREC. In the fifth part of the paper, conclusions are drawn based on the presented facts and recommendations are given for further development of activities in this area. The sixth part of the paper presents a list of used literature.

1. COST MODELS IN PRICE FORMATION OF REGULATED SERVICES IN THE REPUBLIC OF SERBIA

The way of forming the prices of services in the field of electronic communications in general, and even with the two wholesale prices on the fixed and mobile telephony markets, which will be further observed, is influenced by the results of previously performed market analysis (Figure 1) and regulatory measures prescribed by the national regulator. If these are measures of accounting separation, price control and application of cost accounting, the obligation of the SMP operator to apply the currently valid cost model follows. Every year, it is obliged to perform regulatory reporting on the separation of all costs and effects on services and to practically show the regulator the profitability of each service. For those services that

are not regulated, the operator is free to set prices, but there must be no price spillover between regulated and unregulated services

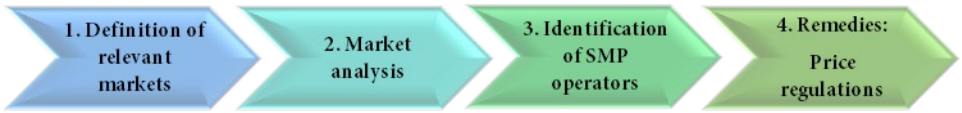

Figure 1. Simplified presentation of the electronic communications market analysis, illustration by the Author

According to the latest European regulatory framework, in each European country, 4 relevant markets should be analyzed in advance (ex-ante) in which it is examined whether there is effective competition. This is done by detailed procedures for market analysis and determining whether there are one or more SMP operators, to bring them appropriate regulatory measures. Thus, in the Republic of Serbia, the number of markets decreased from the former nine to four (Official Gazette of RS, 106/16):

1. Wholesale call termination market in the public telephone network at a fixed location.
2. Wholesale call termination market in the mobile network.
   a) Wholesale market of local access to network elements provided at a fixed location.
   b) Wholesale market central access provided at a fixed location for mass market products

In each of these markets, SMP operators have been identified, as follows: 1 SMP operator in market 3a), 2 SMP operators in market 3b), 5 SMP operators in market 2 and over 30 operators in market 1. All regulatory measures have been introduced, and among the strongest are accounting separation, price control and the application of cost accounting. They require that the selling prices of regulated services of SMP operators are formed based on the cost principle, but in practice they are not cost-based for all SMP operators. Until now, mobile operators have not required cost accounting in the formation of prices, but only control by the regulator, the consequences of which we will discuss in the continuation of our work.

Table 1 briefly lists the cost models that are in use in the Republic of Serbia, their basic characteristics, as well as the periods of application. For all models, regulations

have been adopted with detailed procedures for separating costs and calculating unit prices of services.

Table 1. Overview of cost models with years of application in Republic of Serbia

COST MODELS/ PERIOD	MODEL DESCRIPTIONS
HCA/Top-Down From 2009-2013.	All historical costs from the financial statements are allocated to the services that caused them, directly or through appropriate keys. The ABC concept is applied where necessary.
CCA/Top Down From 2013-2022.	The difference compared to the CCA model is in the valuation of assets, the calculation of depreciation and the concept of capital preservation. The replacement cost method is used to estimate the value of the largest part of the property, and the indexing method and historical costs are used for other parts. Capital valuation is performed according to the Financial Capital Maintenance concept, resulting in capital losses or gains.
LRIC/ Bottom-Up (Pure LRIC, LRIC, LRIC+) From 2022.	Forward Looking costs - the current cost incurred today to meet the assumed demand for the service in the future, taking into account the new valuation of assets. It requires the design of networks in the future if a hypothetically efficient operator enters the market. Incremental costs are the difference between network costs in the case when the SMP operator provides all network services and costs when it provides all services except that regulated service. Depending on whether only the direct costs of the network components of one service, group of services are included in the calculation, or common costs are added, there are several types of LRIC models (Pure LRIC, LRIC, LRIC +).

(Source: Author's processing based on several rulebooks on the cost principle (Official Gazette of RS, No. 103/08, 52/11 and 53/21))

According to the rulebook (Official Gazette of RS, No. 103/08 and 52/11), the selling price, i.e., the target income according to the HCA cost model is calculated as the sum of operating costs and net value of engaged assets, weighted by the capital cost rate:

$$R=O+(V-D)r \qquad (1)$$

In formula (1), the designations have the following meaning: R - income, O- operating costs, V- gross value of engaged assets, D - accumulated depreciation, r- capital cost rate.

The average cost of capital employed is calculated according to the following formula:

$$WACC = Re \times \frac{E}{(D+E)} + R_d \times \frac{D}{(D+E)} \qquad (2)$$

In formula (2), the codes have the following meaning: WACC - weighted average cost of capital, Re - cost of equity, Rd - cost of debt, D - total interest liabilities, E - equity.

In the CCA cost model, the formula for calculating the target revenue is slightly different than in the HCA cost model (1):

$$R = O + Dcca + BD + (V-D)\, r \mp HG/L \qquad (3)$$

The designations in formula (3) have the following meaning: R - target income, O - operating costs, Dcca - depreciation at current costs, BD - backlog depreciation, V-gross value of assets, D- accumulated depreciation at current cost, r-cost rate capital, HG / L- capital gains or losses.

Each year, the regulator determines the WACC rate (2) for regulated markets, to calculate sales prices in the manner (1) or (3), stated in the regulatory reports of SMP operators. The reports refer to all services of the operator, as if they were provided by separate legal entities, to exclude elements of cost spillover between services, and especially between regulated and unregulated services. In this regard, the possibility of charging extra profits on unregulated services is eliminated. The level of prices is influenced by the way costs are divided into services and the WACC rate, which includes the valuation of assets and liabilities of the operator, as well as different risk rates of a particular company and the country in which it operates. All together it affects the level of measurement of "reasonable profit" that can be earned on a regulated service. The dynamics of the WACC rate in the Republic of Serbia, for the mobile and fixed telephony markets, can be seen in Table2.

Table 2. WACC rate by years in Serbia, for fixed and mobile telephony markets

Year	Fixed - in %	Mobile - in %
2020.	10.28	10,19
2019.	10,81	10,82
2018.	11,33	11,05
2017.	12,34	11,93
2016.	13,43-15,28	13,01
2015.	13,73-16,75	n/a

(**Source:** Author's processing, data from the RATEL)

It is noticed that the WACC rate is decreasing from year to year, which should also contribute to lowering the prices of regulated services.

In the following, two regulated prices of services will be observed separately, in two markets - the wholesale market of call termination in the public fixed telephone network and the wholesale market of call termination in the public mobile telephone network. In these markets, every operator that provides these services is a natural monopolist in its network, simply because it is the only owner of that network. The

wholesale price of each of these services is essential for relationships with other operators that appear in these markets when contracting interconnection. This practically means that they pay each other the agreed price of the service per minute, and the total cost depends on the amount of traffic that ends up in their network, from the network of another operator with which they have an interconnection contract. This is a situation at the wholesale level, and at the retail level that is not regulated, each of these prices also affects the formation of the retail price of calls to end users or service packages that have become increasingly popular in recent years. We have seen that these prices can be formed using different cost models, but in practice this was not entirely consistent with the theory, which was shown only in comparison with other European countries that had a longer tradition in applying cost models in this area.

The hypothesis of lowering wholesale prices with the use of cost models was tested on the example of wholesale prices of termination in the fixed and mobile network of operators. The movement of these prices in the Republic of Serbia was observed in the period 2014-2020. year (Figure 3) and at the EU level from 2004-2021 (Figure 2). For the Republic of Serbia, the observation period is shorter because it became an associate member of BEREC in 2012. From the following year, it started submitting regular reports on prices and the use of cost models, together with other EU members and candidate countries, as well as itself. Since 2013, prices in fixed telephony have been formed based on the CCA cost model, so the first such decisions of the regulator have been established since 2014. In this regard, a comparative overview in the field of fixed and mobile termination will be given separately below, where the position of the Republic of Serbia will be clearly seen depending on the used regulatory instruments in the field of prices and decisions made by the regulator.

2. CALL TERMINATION PRICES IN THE OPERATOR'S MOBILE NETWORK

According to the wholesale prices of call termination in the mobile network of operators, in 2020, the Republic of Serbia was among the 2 countries with the highest price in Europe (BoR (21) 71: 5). The last time this price decreased was in 2018, when Republic of Serbia was among the 4 countries with the highest price in Europe (BoR (20) 96, 2019: 25 - 28). The goal of BEREC is to harmonize activities in the field of electronic communications in all member states, which is understandable, especially since these are multinational companies that provide mobile telephony services in many countries (Matavulj, 2021: 78-80).

The common goal of both the company and the regulator is to reduce interconnection costs, but since these are natural monopolies in the wholesale mobile call termination market, companies that are the last to enter this market tend to have

a slightly higher price than others to compensate for initial interconnection losses. In recent years, regulators have determined symmetrical prices in this area based on cost models, in which LRIC is dominant for this purpose, according to the Bottom-Up method. The use of other models is not forbidden either, but the regulators themselves realize that the LRIC model is a powerful tool in regulating these prices, because it leads to a continuous fall in prices on an annual basis.

In Figure 2 (BoR (21) 71:21) the decline in this price in the period since the existence of BEREC (2004-January 2021) was over 95%.

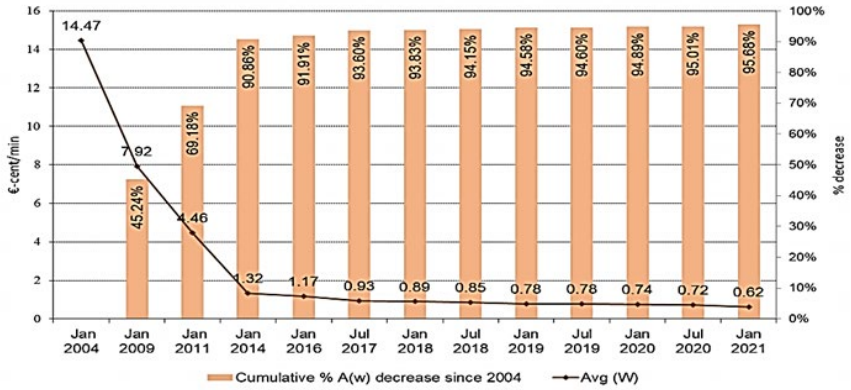

Figure 2. European MTRs weighted average and cumulative decline, BEREC

If we look at all 37 BEREC member countries, the average price of mobile termination by the end of 2020, i.e., in January 2021, was 0.62 eurocents per minute. At the end of this period, the Republic of Serbia had a price of 1.22 eurocents per minute (1.43 RSD, Figure 3), which in 2020 ranked it 36th in Europe (BoR (21) 71:15). It is fair to say that Republic of Serbia does not currently have a competitive wholesale price for mobile termination, which is an alarm for taking more adequate regulatory moves in the long run.

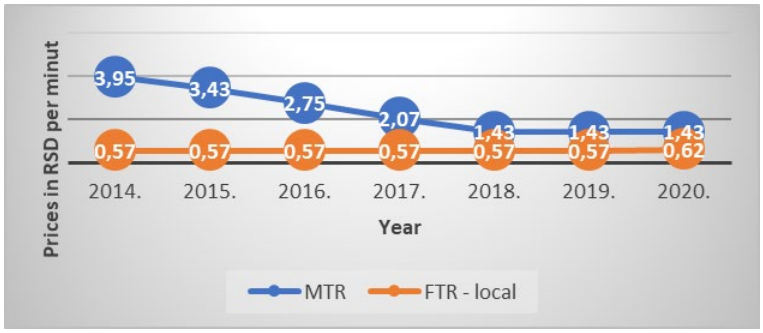

Figure 3. Mobile (MTR) and fixed (FTR) local termination rates in Serbia from 2014-2020; Author, based on RATEL data

In the BEREC Report for 2020, in relation to the countries presented in previous BEREC reports, only Republic of Serbia kept the Benchmarking method with the countries of the region as a method of price calculation (RATEL, 2017). Almost all other countries have introduced the LRIC model (25 countries), and some in combination with Benchmarking but with countries that apply it (6 countries). If it is not one of the variant LRIC models, then it is a combination of other cost models. As a result, lower prices of mobile termination and lowering of the average price of mobile termination in the EU were obtained, including a narrower sample (Avarege S) with EU member states and a wider average (Avarage W) with all BEREC member countries. Since the Rulebook on Amendments to the Rulebook on Cost Principles (Official Gazette 53/21) entered into force in Serbia only in 2021, the first application of the LRIC cost model is expected only in 2022, and then the first reduction of the price of mobile termination based on cost principle. Then we can expect a shift in the price towards the European average and abandoning the infamous position of Serbia, which has always been at the bottom of the list of BEREC member countries (out of 37 members, Republic of Serbia has always been between 33-36 places).

3. PRICE OF CALL TERMINATION IN THE OPERATOR'S FIXED NETWORK

The average lowest wholesale price of termination in the fixed network of operators (i.e., the price of a local call) in all 37 BEREC member countries in 2020 was 0.24 eurocents per minute and looking only at EU countries - 0.20 eurocents per minute (BoR (21) 71: 4). The Republic of Serbia with its 0.53 eurocents per minute (0.62 RSD, RATEL, 2019) (Figure 3) is certainly not competitive enough, but the situation is slightly better than the price of mobile termination, because it is on the 32nd place on the list of observed countries.

In the entire period of existence of cost models in the Republic of Serbia, wholesale prices of termination in the fixed network were calculated on the cost principle until 2017. Then, for the first time, a single symmetric price was introduced for all operators in fixed telephony, while previously there were three levels of interconnection and three prices for the leading fixed operator. For other fixed operators, there was a single symmetrical price, which was not based on the cost principle, because they were not obliged to account for accounting separation and apply cost accounting. Since the introduction of a single price for all operators, price regulation based on the CCA cost model used until then has essentially been abandoned and switched to the Benchmark method, as presented in the BEREC report (BoR (21) 71: 29). This resulted in a worsening of Serbia's rank compared to the previous position, where the price of fixed termination was always close to the European average. Other countries have continued to lower this price by applying cost models. As with the prices of termination in the mobile network, the fixed

network is dominated by the LRIC model in 24 countries, in 5 countries LRIC is used in combination with the Benchmark, while Republic of Serbia remained at the same price from 2017.

Observing both prices, it can be concluded that there has been a delay in price regulation in these markets since 2017. which left the Republic of Serbia at the back of European countries in the application of strategic management accounting in the regulation of these prices. This confirmed the hypothesis that cost models affect the reduction of regulated prices, which certainly has a double benefit - for the operators themselves in the wholesale markets, but also for end consumers at the retail level. In the conditions of the existence of a natural monopoly, the regulator is obliged to provide the conditions for fulfilling both benefits, and it is expected that the full application of the cost model will achieve this.

CONCLUSION

Strategic management accounting helps management decision makers to operate more efficiently based on comprehensive market information, in addition to their own financial indicators, but the same is true for regulators. The strategic connotation of cost and price management is completely evenly transferred from the company level to the level of the state, i.e., the regulator of a sector, thanks to the existence of modern cost models for price regulation. HCA, CCA and LRIC cost models are the most widespread, especially in the regulation of electronic communications prices, where there are natural monopolies. Regulations for their implementation have been developed at the level of EU institutions and further implemented in the national legislation and practice of individual countries. The goal of their application is to continue the trend of lowering the prices of services of dominant operators, for services that are under regulation, because otherwise SMP operators would not lower them themselves. Lower prices become competitive for new operators that appear at the wholesale level, but also for end consumers of services in retail markets.

The Republic of Serbia has implemented all European recommendations in this area in theory, through bylaws, but in practice not everything that has been planned has been consistently implemented, so the best scope for using cost models has not yet been achieved. On the examples of comparison of wholesale prices of call termination in the fixed and mobile network of the operator, the set hypothesis was confirmed that cost models really lower the regulated prices, and therefore they should be used consistently.

Cost models in the Republic of Serbia should not only gain importance in the field of electronic communications, but also in other system activities where there are many activities, and thus problems with allocating costs to services that really apply (traffic, energy, postal services, etc.). The strategic dimension of management

accounting provides strong support in this, so in the future it is expected that the regulation of prices within the companies themselves will be raised to a higher level - when the companies themselves realize the advantage of forming such prices as if imposed by the regulator. This is closely related to the recognition of the need of companies for constant growth of efficiency and competitiveness of business, the basic part of which is the reduction of costs and prices of services.

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