A Practical Tariff Methodology for Port Authorities

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Abstract

This work describes a practical tariff model regarding public ports, using the new normative launched for the National Agency of Waterborne Transportation (ANTAQ) in Brazil. It also brings analytical elements of economic balance based on appropriate average costs in each tariff modality. Contains a complete mathematical-financial model, including a numerical, hypothetical and general example - a case study serving as a starting point for all other concrete cases.

Index terms— port tariff, pricing, port, port authorities, economic regulation

1 Introduction

n Brazil, the former "Port Modernization Law", Law No. 8,630, of February 25, 1993, provided that private terminals could predominantly handle their own cargo, which was an inhibiting factor that significantly reduced the possibility of competition between public ports and private terminals. The current regulatory framework, Law No. 12,815, of June 5, 2013 ("New Law of Ports"), has expanded the possibilities of creating port infrastructure, freeing up the possibility of handling third-party cargo in Private Terminals (TUPs). Deregulation had the effect of a vertiginous growth in the number of TUPs, now in open competition with leases in public ports areas. Thereby, managers of public ports were forced to face a new market, leaving, to the past, the monopolistic position, in search of greater competitiveness and new revenues. The motto became efficiency, with the port tariff being a key factor for such success.

Port structures directly influence national navigation, impacting the product price for end customers.

Therefore, when we talk about modernization and competition, we are also talking about adequate and reasonable port tariffs, which encourage the greatest possible movement within public ports, sustaining quality infrastructure, as the order of the day is to reduce the "Brazil Cost". authorities and a list of procedures for projects of review and adjustment of prices. Those rules created several new concepts, including: Tariff Modality, Required Revenue, Market Segmentation, Reference Period and Tariff Group.

Some highlights include article 15, which defines two procedural typologies: the tariff review, which may be extraordinary or ordinary, and the tariff readjustment. Article 16 informs elements of analysis, establishing a tariff review model based on the balance of projected revenues with the projected average costs of each service for the subsequent period. However, there is a lack of information: a mathematical-financial model and the nuances of this type of analysis.

The purpose of this work was the development of an application model with a hypothetical and general case study, using ANTAQ´s rules contained in RN 32/2019, establishing the difference, in Brazil, between adjustment of tariffs and review of tariff, as well as analytical elements of economic-financial balance. The tariff modeling also seeks to elucidate a list of general principles for all those involved in the transportation services inside public ports, especially those provided by port authorities.

2 II.

3 Development a) Price regulation in Brazilian public ports

"Price regulation" is understood, in Brazil, to be a regular government activity whose tool is a set of methodologies that determines a maximum or minimum price used by public utilities, carriers and service providers to charge its consumers for each product or service provided. Since such economic agents most often hold monopoly power,

where the efficient price does not arise from a normal interaction between demand and supply, thus it is up to an independent agency to arbitrate the price. Therefore, it is a good method of replacing the competitive market, simulating its results.

Price formation is a central issue to regulation, as it concentrates questions about the operational cost distribution to consumers, including subsidies.

4   Table 1: Eleven principles of the Brazilian port tariff

In Brazil, "tariff" is a type of price (and its ways of charging) regulated by an Agency or Federal Department. Also called "public price", as it is related to some state attribution. Usually used to deal with monopolies in the provision of essential infrastructure (transport, energy, telephony and sanitation). The regulated company's profit will not be so great that the consumer feels harmed, but it will not be so small that the entrepreneur feels uncomfortable (or discouraged) in investing high resources. It must be set at an adequate level to facilitate mortgages (therefore, it must be higher than market interest rates, or on the contrary, the loan must be subsidized by state banks) aimed at improving services or expanding infrastructure.

The port tariff, a concept created by Decree No. 24.508, of 1934, and by Law No. 3.421, of 1958, is the price offered by Brazilian port authorities for supplies within the respective public port under their commercial management. It consists of a price list, called, in industry jargon, "tariff table", through a metric (or form of tax incidence), called "tariff modality". The tariff table must be "public", with ample and prior knowledge of users (within a consolidated document). The value of the transaction is voluntarily assumed or provided by those who intend to use an available service, and it is not, therefore, a mandatory obligation arising from the legislation. It is carried out upon request, usually verbal, that is, on demand, without any kind of individual contract between the parties.

In terms of market structure, the port authority, manager of the public port (sometimes called "organized port") can be seen as a monopolist firm that discriminates N-Products, in addition to the following microeconomic characteristics: intensive in labor, sunk costs, economies of scale, barriers to entry, high fixed costs, low incentive to innovation, government participation in investments, extraordinary guarantees and a large presence of public goods. An alternative framework is also possible, such as a non-cooperative oligopoly, given that there are several ports in Brazil. However, we see some level of hegemony in certain types of cargo at certain ports, so that it is possible to model it as a monopoly, with a good dose of assertiveness, even if they face competition.

This market power has been decreasing since the 2010s, mainly due to the advent of new private terminals (there are more than 200 nowadays), but it is still predominant because relationships are often very complex inside the transportation area and "essential facilities". The simple entry of new providers is often not enough to reduce the market power of pre-existing agents. There are intangible aspects related to any business, such as loyalty, long-term relationships, trust between people and perception of quality. Another point is the idle capacity, where the local land transport infrastructure and the retroport areas also influence the choice of the embarkation or disembarkation port, as well as the offer of maritime routes by ship-owners.

In price regulation, there are several methods, but for the purposes of our work, we are going to work with two: Regulation by rate of return (cost pricing) and Regulation by ceiling price (price cap). That's what we'll see now.

5   b) Generic tariff review

In the Brazilian public ports, we define the Tariff Review as a procedure to evaluate and examine all costs and revenues of a regulated company, renegotiating a new level of profitability for future investments, without any prior indexes, in order to ensure balance of the original economic-financial framework (re-equilibrium). It can be regular (in cycles) or not (it is suggested that the first cycle is three years, and may be extended to four years in the second and five years in the third), depending on the contract To the user's enjoyment.

6   Specific and divisible

There is certain imputability to a particular user, separately identifiable, according to measurement. (public-private partnership) signed with the port authority. In half of the cases, there is no contract, because companies belong to the federal government, which makes price regulation challenging, due to the lack of contractual obligations. There are many review hypotheses; the most common is when a significant amount of new legal taxes or new investments (not originally foreseen in the "contract") is obligated by the Agency or Federal Government, generally for improving quality or expansion infrastructure. Existing prices will not be sufficient to cover all the news costs.

Until the mid-1980s, the most used method for tariff review in countries was price regulation according to the "cost of services", also called regulation by the internal "rate of return". The method was generalized from the North American experience started at the last century, with the regulation of monopolies. In other countries, there was no tradition of such regulation, as the service providers were, most of the time, government-owned (state-owned enterprise) -monopoly profit being appropriated by the State, as in Brazil.

From the perspective of US regulation, successful pricing is one that achieves the following main objectives:

? Avoids pricing below cost (including a "reasonable" return); ? avoids arbitrary profits; ? Facilitates agility in the process of defining and revising tariffs; ? Prevents misallocation of resources and inefficient production; and ? Establishes non-discriminatory or inappropriate prices among different types of consumers.

It seems to us that this perspective is appropriate to the Brazilian port sector, and is reflected in normative. Prices must remunerate total costs and contain a margin that provides a positive rate of return for investors.

Thus, the regulation by "rate of return" implies that, for example, a regular company providing a maritime access is authorized to set a toll fee in order to cover all the operating costs (which includes payment of employees, car fuel, machinery, expenses with water and electricity, equipment maintenance etc.), and the necessary loans for expanding the infrastructure, in addition to sustaining a reasonable profit based on investments and expenses.

In this example, the Regulator decides which expenses and investments are acceptable to compose the calculation, which is not a simple task, mainly because of information asymmetry, in which the firm always has more data than the regulator. At each period, based on accounting data, the depreciation policy and inflation in the period, tariff levels are set under certain market hypotheses. There may be negotiations on various aspects, in particular on what to do with the frustrated profit in the previous period compared to a forecast (for example, results can be compensated and included in the costs).

The regulated company's profit will not be so great that the consumer feels aggrieved, but it will not be so small that the entrepreneur feels uncomfortable (or without incentive) to invest high resources. The rate of return must be at an appropriate level to facilitate mortgages (therefore, it must be higher than market interest rate, or otherwise the loan must be subsidized by state-owned banks) aimed at improving services or expanding infrastructure.

To avoid excess profits, the Regulator, in general, determines the rate of return through a negotiation process with the service provider or representatives of the sector, listening to the group of affected users. In fact, the authority needs to pay attention to the market, i.e., to the rate that the business community is expecting (expectations is a central theme within the economy). A lower rate than expected generates less attractiveness for investments, reduces the value of the concession, auctions with few offers and low competition in the market dispute. In a kind of benchmarking regulation, the Regulator, when evaluating the review proposal, will be able to compare the project prices with similar ports, or even with the lowest known price, supposedly considered the most efficient.

The tariff review procedure is much more complex when there are several services provided by the firm, which is one of the objectives of this work, that is, a proposal for that. In this case, the definition of the different tariff levels requires apportionment of common costs (indirect and overhead) in order to obtain consistent relative prices that reflect efficient allocation.

In these more complex cases, there are three more general methods of apportionment formulas: i) according to the specific costs of which goods or services (as authorized by Law No. 8987, of 1995); ii) according to the income obtained by which goods or services; iii) according to the quantities of goods or services sold in the last period. All three are arbitrary to some degree (and the last two are circular, which can generate a vicious circle of errors) and can lead to inefficiencies and cross-subsidies.

The possible risk of unbalance is not enough to request an extraordinary tariff review; a real fact must have occurred, i.e., the "contract" must already be unbalanced. Therefore, the extraordinary tariff review does not take place at any time, only after an imbalance. There is some jurisprudence about that.

Furthermore, the re-equilibrium is not a discretionary act of the Regulator. He can only refuse granting you in one of the following situations:

? No real increase in charges;

? Occurrence of the event prior to the winning proposal (in cases of bids at auctions); ? Absence of a causal link between the events; and ? Bad management signs and guilt (intention) of the company for increasing his charges.

In case of port authorities that are governmentowned, the lack of a contractual provision does not affect the application of the re-equilibrium model, because its foundation is not contractual, it is legal.

The Regulator should define an incentive-based regulation scheme that minimizes uncertainties and reduces information asymmetry, with a main driver of incentives for cost reduction during the tariff revisions period. During the intervals between tariff revisions, the Brazilian regulator applies a price-cap readjustment methodology.

In this model, a tariff cycle is imposed, which consists of the corresponding period of time between two ordinary tariff revisions, comprising a minimum period of 03 (three) years and a maximum of 05 (five) years, according to ANTAQ. It also informs that the first cycle, in existing contracts, begins with an extraordinary review. See Table 2 that the cycle starts with an extraordinary review. First year, RN 32/2019 says that the extraordinary tariff revisions will be carried out at a request and promotion by the Regulator, ex officio. This will be the opportunity to contemplate the migration from the current tariff structure to the structure standardized by ANTAQ. Normally, every year or at the end of each Tariff Cycle, the Agency publishes calendars for companies in order to present their claims for annual readjustment or for an ordinary tariff review within a fixed period, which may coincide with the contract anniversary date.

Now it is finally necessary to state: applying the rate of return method is always difficult for Brazilian government agencies. This is explained below.

First, the regulation by rate-of-return method, given the complexity of its operation, is an appropriate method only when cost and demand conditions do not change significantly in short periods of time, i.e, when costs and demand are relatively stable. In the opposite situation, this process becomes much slower. In this condition, the cost and demand estimate is impaired for a medium period, say four or five years ahead, making it difficult to find the equilibrium parameters of the equation: what will be the Total Revenue and what will it be the Total Cost of the firm, remembering that the natural monopoly has that characteristic of subadditive cost: the more it produces, the lower the cost per unit. It seems to be the case in the Brazilian port sector, generally having annual incremental demand at a rate of less than 4% in most cases. Furthermore, it is known that variable costs in port authorities are substantially reduced when compared to fixed costs, a condition that inhibits the application of pricing techniques related to marginal cost, which also depends on knowledge of a more accurate demand curve (MONTEIRO, 2017).

Second, applying only regulation by rate of return, there are no incentives for the firm to seek efficiency, due all costs are passed on to consumers, and as companies' efforts to reduce costs do not increase their profits. The non-exogenous behavior of costs must be considered: the charging form affects the cost of production of the service. The doctrine shows us the existence of the Averch-Johnson effect (over investments).

Finally, the regulation by rate of return requires a lot of information to be submitted to, lacking a good deal of confidence um some of those.

However, the Cost of Service model still persists in Brazil, especially when we observe the presence of state-owned companies as service providers, or even private concessionaires, which is the model adopted by ANTAQ, with increments related to performance (productivity) and value (elasticity), as recommended by UNCTAD (1995).

7 c) Practical model of regular tariff review

In order to present projects, Article 16 of RN 32/2019 sets out a list of requirements to be attended by port authorities, as shown in Figure 1 If there are no demand or cost studies for the subsequent period, the same trend line in the previous period will be adopted and the same average costs and other non-tariff revenues for the subsequent period, month by month, of the preceding period. In the case of new tariff modalities, without previous invoicing, the port authority must present demand estimates (to be obtained directly from the users), and an initial estimated price, such as an original price. Scenario nullifying the total Operating Profit, considering the subsequent Reference Market, through an identical Linear Adjustment Index for all tariff modalities.

Balances the total cost without changing revenue allocations among users. Less impact for users as it only reproduces the status quo.

8 Price = Specific Average Cost

Scenario nullifying the total Operating Profit, considering the subsequent new Reference Market, through the calculation of new prices for the tariff modalities, so that the price of each modality is equal to the average cost of each product.

Balances total cost by changing revenue allocations among users to equal cost equal to revenue. Impact for users, however, tariffs tend to become more neutral, without cross-subsidies.

9 Positive (cross subsidy with Nproducts)

Positive total Operating Profit scenario, considering the new Reference Market, by calculating new prices for the structure's tariff modalities, so that the price of each modality is equal to the average cost of the product multiplied by its mark-up. The mark-up can be unique for all modalities, or chosen individually, positive or negative, due to demand elasticities (see Ramsey's Rule).

Balances the total cost by shifting revenue allocations between users unevenly. Starting from the real average cost, it is possible to practice a flexible commercial policy aiming at maximum revenue capture according to the marginal utility of each user, reducing deadweight loss, without harm to users.

Explore the demand curve. IV -SALES AND PROJECTED DEMAND

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? Invoices in the previous reference period, by tariff modality;

? Average monthly demand project, by each tariff modality.

As an objective function, the tariff review will assess, for a given port authority, the annual Operating Profit [OP] of each Tariff Group "j" or the sum "k" of them, in the following sequence: Initially, the Operating Profit of the current Tariff Structure will be evaluated, considering the Previous Reference Market of the port administration and then the new proposed Tariff Structure will be simulated, in the following scenarios (Table 3).

After analysis of scenarios, the current Tariff Structure and the proposed Tariff Structure will be characterized in one of the following situations: Balanced or Unbalanced. It will be considered Balanced, in general, the Tariff Structure k that provides a total Operating Profit equal to or greater than zero for the next twelve months. In this model, the Operating Profit level replaces the rate of return concept.

The scenarios indicate that the port tariff will have a ceiling price based on the composition of three dimensions: cost (expenses to deliver the product), performance (level of capacity and productivity) and value (marginal utility or consumer elasticity).

The model can be described in the following flowchart (Figures 2 and 3). 3 -Inform market data (average monthly movement in the last 36 months and average monthly demand projected for 36 months ahead), for each tariff modality. Also inform the installed capacity, to assess the utilization factor (the higher, the higher the productivity);

4 -Inform the values of the Income Statement accounts for the last 36 months, that is, Operating Revenues, Alternative Revenues and Financial Revenues Costs (Direct by Tariff Group, and Indirect) and Expenses, including Financial Expenses;

11 -Report:

A. For the previous period, the apportionment percentages in indirect costing and administrative expenses, aiming at the allocation of these costs in each Tariff Group (full absorption method); B. For the preceding and subsequent period, the internal weights of the items that make up the efficient operating costs in each Tariff Group, that is, drivers that represent the loading and distribution of expenses in each tariff modality in relation to the expenses appropriated for the respective tariff group ; C. For the subsequent period: a. The increase in average production costs, monthly direct and indirect, and other monthly expenses, appropriated by tariff group, in average monthly terms (the higher the increase, the lower the productivity); b. The amount of investments in capital goods, in annual installments to be amortized; c. Forecasting alternative revenues and installments from other sources, including non-operating revenues, in average monthly terms;

Other Revenues. Current and projected Profit and Rate of Return of each Cost Object and for all operation Mark-ups for each tariff modality (2nd and 3rd degree price discrimination) The boundary conditions for the model's operation are as follows:

12 d) Extraordinary tariff reviews

An extraordinary tariff review will adopt the same methodology used in the ordinary review. However, according to the doctrine, the projects for extraordinary tariff reviews must identify the causal link responsible for the imbalance.

The instruction of requests for extraordinary tariff review shall inform the occurrence of an effective economic and financial imbalance, already manifested, or an economic and financial imbalance not yet manifested, if and only if the project considers an annual amortization of future investments in infrastructure to be covered by the tariff.

In these cases, requests for additional tariff revenues to cover capital expenditures on future investments in port infrastructure must be linked to a physical-financial schedule, agreed upon with the Regulator. When considering the use of some level of third-party capital, the non-governmental bank institution should not be remunerated through an interest rate above that normally practiced by the market.

The events giving rise to extraordinary review are (causal link):

? Increase or decrease in capacity;

13 Case Study

In the following test, in order to simplify the demonstration, we will assume the existence of two tariff groups, as in Table 4, associated with two cost objects and respective tariff modalities. To simplify further, there will be no changes in the structure, keeping the tariff modalities for the next period, without additions or exclusions. We have two different moments: year A0 (year of start) and year A1 (year to be rebalanced). After evaluating the current equilibrium level, the goal is to find a new ceiling price for tariffs in the A1 period, at a new equilibrium level.

The costing method, for tariff purposes, was discussed in Technical Note No. 64/2017/GRP/SRG (ANTAQ, 2017c) and Technical Note No. 50/2017/ GRP/SRG (ANTAQ, 2017b). It is a kind of Integral (full) Absorption Costing. However, Activity-Based Costing (ABC) method is also allowed, as a form of management improvement.

Absorption Costing is simple, suitable for midsized companies and provides a lot of information. It's a cost method that includes all manufacturing costsdirect materials, direct labour, and both variable and fixed overhead (indirect costs) -in unit product cost. Integral costing method is a principle whereby fixed as well as variable costs are allocated to the cost unit. On the other hand, absorption costing involves the appointment of overhead, which can be subjective. The resulting information can be misleading for management decision-making.

ANTAQ defends that the "main merit of the Integral Costing Method is the fact that all expenses incurred in an organization are taken into account, without exceptions. In it, we have the total recovery of all company expenses for the delivery of a given cost object. This results in more complete unit cost information. However, it differs from the conventional Absorption Method, as even the No-product cost (expenses, selling, administrative, lawyers, for example) are allocated to cost centers (or cost objects) -however, it has a very similar logic to that."

Using this method, costs that are assigned to cost objects can be divided into two categories: direct cost and indirect costs. Direct costs are those costs that can be specifically and exclusively identified with a particular cost object. In contrast, indirect cost cannot be exclusively with a given cost object.

ANTAQ mapped Nine Cost Objects for Brazilian port authorities, and transposes these objects into the tariff structure, because they are intimately connected with the tariff tables. Objects are the aggregation of different tariff modalities that have a high degree of affinity with each other regarding the products supplied or of type of users.

In the Integral Costing Method, the product offered by the company is responsible for absorbing all charges. Indirect costs must be allocated to the costing objects using apportionment criteria. ANTAQ assumes that there should be a proportional relationship between type of cost and the costing objects (indirect costs should be smaller compared to direct costs, for example).

The apportionment is carried out using indices that will direct the distribution of the Indirect Cost (and General Expenses) to the cost objects. Then, the percentage that the products consume of the adopted index is estimated. They then settle the overhead based on that percentage. All expenses related to the production and delivery effort are, therefore, distributed to all products or services offered. To reduce the arbitrariness of the Costing Method, there must be a cause and effect relationship between the distribution parameter and the volume of indirect cost. The variations that determine how the entity's resources are used by the costing objects must also be identified.

The hypothetical apportionment percentages to be used (both for the preceding and subsequent periods) in the case study are in Table 5: The Operating Profit of -18.21%, as shown in Table 7 in Step 3, proves the unbalance in the current tariff structure.

Then, in the Output phase, assuming, in our hypothetical case, a 10% growth in costs and expenses for the subsequent period and promoting a Scenario in which the tariff is equal to the average cost (P = Cme = Total Cost / Average Demand), redoing all the calculations in the previous table, the Operating Profit (IRR) would be would be nullified, and the final result will be a Balanced Situation, with the following prices-cap (Still in the Output phase, other positive scenarios can be simulated, such as, for example, a positive profit of 10%, applying individual markups in the modalities (discriminating, applying the Ramsey Rule) or even a general linear percentage for all of them (without internal cross-subsidization).

Restricting the test to the "Tariff Equal to Average Cost" Scenario, the final result of the analysis indicates the following summarized data (Table 9):

14   Conclusion

This study demonstrated a mathematical and economic model, based on efficient allocation costs, to be applied for tariff review by port authorities and all public ports -controlled by the federal government or even concessionaires (although concession contracts may contain their own specific rules). This proposal is being gradually implemented by the Agency during the years 2021 and 2022. As we see, it allows the search to various points of balance, to be tested by the company and negotiated with the Regulator, assisting in a price sensitivity analysis.

There are advantages and disadvantages.

Advantages: the profit of the port authority is monitored (a kind of "supervised freedom"), so that only the cost plus a certain percentage is paid by the consumers. In theory, this cost would fall, as the contract progresses in time, and the efficiency gains would be passed on to the consumer, preventing an arbitrary profit.

Disadvantages: as we guarantee a minimum rate of profit for the entrepreneur, it does not provide sufficient stimulus to increase efficiency, which is important in face of technological changes. The inverse of the expected would then happen: the price, discounted for inflation, would rise over time, or, the quality would fall. Therefore, it should be used together with other instruments, as a productivity factor (X Factor) within regular annual readjustments in a cycle logic.

The model presented here contributes to a reduction of uncertainties. Demonstrates something viable in efficiently allocating resources. It is flexible enough to be adopted by service providers, because it does not remove the possibility of a positive profit and of establishing a commercial policy aiming at maximizing total revenue. It also provides transparency and predictability to the market. To obtain the final price, other elements can be added to the cost, such as, for example, the perspective of added value to the consumer and productivity, a theme for the next paper.   [1] [2] [3] [4]

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[2] -Compose all the data and simulate the price-ceiling scenarios, comparing the current scenario with the scenarios of the subsequent period, observing the particularity of each scenario regarding commercial strategy, contribution margin and the expected level of return (operating profit) ;

[3] According to Table 67 of the ANTAQ Manual of Accounting to Port Authorities, 2017 version.2 Non-charged modalities are those that are at a higher hierarchy level than the subsequent ones. They have no price, just in the lowest level.

[4] © 2021 Global JournalsSetting all these initial parameters, it is possible to start the Process phase. An analysis of the Current Scenario indicates an unbalanced situation, as shown in Table7(Steps 1, 2 and 3).

2

Procedure	Period
1st Extraordinary Review	year 0
Annual readjustments	Year 1,2, 3 and 4
1st Ordinary Review	Year 5
Annual Readjustments...	Year 6, 7, 8 and 9

Figure 1: Table 2 :

3

SCENARIO	DESCRIPTION FEATURES
Balanced (linear adjustment)	

Figure 2: Table 3 :

4

? Exogenous variation of operating costs;
? Change in legislation or regulation that impacts business;
? Natural accidents and claims do not covered by insurance;
? Legal taxes change, except income tax;
? Strikes and riots.

Figure 3: Table 4 :

5

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Cost Objects	Tariff group	Labour % of	Indirect Costs	3rd Party Services	Materials
Maritime Infrastructure	I	82	82	82	
Docking Infrastructure	II	18	18	18	

Consider the following accounting statement for the preceding period, following the chat acc ANTAQ Manual of Accounting (ANTAQ, 2017a) (Table 6):

Figure 4: Table 5 :

6

Chart of Account -Code	Degree	Account Title	Monthly average for the previous 36 months (BRL)	
3	1st	INCOME REVENUES		
3.01	2nd	Gross Revenue from Port Services		
3.01.01	3rd	Waterway Access Infrastructure	15,500,000.00	
3.01.02	3rd	Berthing Infrastructure	8,500,000.00	
3.01.08	3rd	Leasing Agreements	300,000.00	
3.01.10	3rd	Alternative Recipes		
3.01.10.02	4th 4th	Other operating income Complemen-	192,000	Year
3.01.10.03	4th	tary Sales Accessory Sales	259,000	2021
3.01.10.04			343,000	
4	1st	PRODUCTION COSTS		
4.01 4.02 4.08	2nd	Maritime Infrastructure Berthing In-	9,000,000	Volume
4.10 4.10.01	2nd	frastructure Lease Agreements Indirect	4,500,000	XXI
4.10.02	2nd	costs Labour (salaries & benefits) Ser-	25,000	Issue
4.10.03	2nd	vices Materials Others Costs Allocated	3,000,000	V
4.10.04 4.12	3rd 3rd	to Complementary Sales	1,500,000	Ver-
	3rd 3rd		500,000	sion
	2nd		500,000	I
			500,000	
4.13	2nd	Costs Allocated to Accessory Sales	25,000	( ) B
5 6 6.01	1st 1st	GROSS PROFIT (3 -4) EXPENSES	3,900,00	Global
6.01.01	2nd	Administrative Labour (salaries & ben-	1,950,000	Jour-
6.01.02	3rd 3rd	efits) Third Party Services Utilities &	390,000	nal
6.01.03	3rd 3rd	Telecommunication Miscellaneous costs	390,000	of
6.01.04	3rd 3rd	Rent Marketing & Branding Deprecia-	390,000	Man-
6.01.06	2nd	tion & Amortization Financial Interest	390,000	age-
6.01.07 6.03	2nd	income Interest expenses	390,000	ment
8.01 8.01.01	3rd 3rd		780,000 50,000	and
8.01.02			45,000	Busi-
				ness
				Re-
				search

Figure 5: Table 6 :

7

Group / Cost object	Item	Tariff Modality (incidence form)	Charged		Step 1: Cost Ceiling price without adjustment or Tpi [BRL] revision	Average monthly demand in A0
	1	Fixed fee for waterway access	Yes 2,300.00			600
Year / 2024 Maritime Infrastructure	2.1 2	operations For long-haul of a vessel Variable tariff, by the deadweight tonnage of the vessel	Yes Not		38.00	16667
	2.2 1	For coastal or inland navigation operations To the main berth Not Yes			55.00	100,0
II / Berthing Infrastructure	1.1	Per linear meter occupied by vessel, per hour or fraction, up to a limit of 48 hours.	Yes		160.00	20000
( ) B	1.2	Per linear meter occupied by vessel, per hour or fraction, after 48 hours.	Yes		330.00	12000

Step 2: Dispersion of Revenues

Group / Cost object	Item	Tariff Modality (incidence form)	Charged		Average monthly demand in A0
	1	Fixed fee for waterway access of a vessel	Yes		600
I / Maritime Infrastructure	2 2.1	Variable tariff, by the deadweight tonnage of the vessel For long-haul operations	Not Yes		16667
		9			
	2.2	For coastal or inland navigation	Yes		100,0

14 CONCLUSION

8

Figure 7: Table 8)

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Group I
Maritime Access Infrastructure

ITEM	TARIFF MODALITY / FORM OF INCIDENCE	Current Rate / Price-Cap in A0	Rate Equal to Average Cost / New Price Cap in A1
1	Fixed fee for waterway access of a vessel	BRL 2,300.00	BRL 3,022.96
2	Variable tariff, by the deadweight tonnage of the vessel		
2.1	For long-haul operations	BRL 38.00	BRL 48.97
2.2	For coastal or inland navigation operations	BRL 55.00	BRL 81.62

Group II
Berthing Facilities

ITEM	TARIFF MODALITY / FORM OF INCIDENCE	Current Rate / Price-Cap in A0	Rate Equal to Average Cost / New Price Cap in A1
1	To the main berth		-
1.1	Per linear meter occupied by vessel, per hour or fraction, up to a limit of 48 hours.	BRL 160.00	BRL 156.73
1.2	Per linear meter occupied by vessel, per hour or fraction, after 48 hours.	BRL 330.00	BRL 319.26

Figure 8: Table 8 :

9

CURRENT / CURRENT SCENARIO	FUTURE SCENARIO / TARIFF = AVERAGE COST
Year A0	Year A1
OPERATING REVENUES -RO	

Figure 9: Table 9 :

333 [Monteiro and José ()] '17/papers/-um-estudo-sobre-os-custos-da-adminis tracao-portuaria-ea-tarifa-pelo-custo-
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