A NEW APPROACH FOR THE RENTAL RATE EVALUATION IN A PORT

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ABSTRACT

The work presents a new approach of the method of determining the rental rent for the land in a port. According to this approach, the final rental rate must be dependent on how the port operator meets certain efficiency clauses (traffic clauses, performance clauses, consume clauses, environment clauses etc.). In the same time techniques of subsiding or adjusting the rate are introduced depending on the level of implementation of the efficiency clauses.

Keywords: *Rental rates in ports.*

1. INTRODUCTION

MTI Order no. 1286/August 7, 2012 [2] approves the regulation on renting shipping infrastructure in the public domain of the state. It should be noted that this infrastructure is leased to port administrations. At this time between the operators of the Constanta port dock and "Maritime Ports Administration" SA Constanta there are contracts which establish mutual obligations. In accordance with these contracts port operators have been forced to pay a fee to take into account the use of port area. Additionally, two types of clauses introduced. Namely they are: traffic clauses or performance clauses. Traffic clause is strictly related to the amount of goods coming from the operator. Clause performance is strictly linked to the operating speed of the port operator.

In accordance with the legislation in force, the duty to take into account the use of range port must be converted to rent reported to the land use [1]. The value of the rent reported to the land use is determined by tender. Whereas in many circumstances in the invitation to tender shall attend a single tenderer, it is necessary that the starting rental rate in respect of the invitation to tender to be "judicious use" chosen. Supplementary, at least one of the two clauses mentioned above must be introduced in the contract [1].

2. PROBLEM FORMULATION

Procedure used at this time does not seem to be incentive for potential investors. Even more, the important operators want to change contractual relations between them and "Maritime Ports Administration" SA Constanta. Starting from these points of view, two problems must be solved:

- Starting rental rate of the tender;
- Implementation of different clauses in the final rental rate.

3. STARTING RENTAL RATE OF THE TENDER

It is important to mention that the starting rental rate is established by Council of Administration. The Council must keep in mind the rental rates proposed by an independent evaluator. In the same time two other important parameters must be mentioned:

- The area ("s")
- The cluster ("cl")

In these circumstances one can write:

$$T_p = T_p(s, cl) \tag{1}$$

where:

T_p The starting rental rate of the tender

Figure 1 presents the characteristic family that may be associated with formula (2):

$$T_p = T_p(s)\Big|_{cl = const.} \tag{2}$$

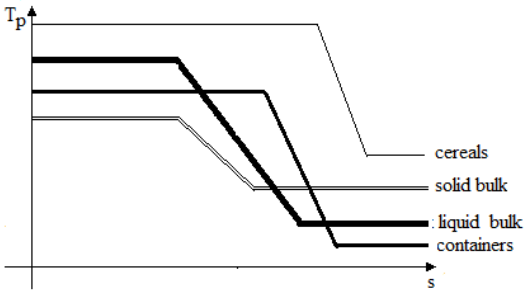

Figure 1 Dependence of the starting rental rate on clusters

4. FINAL VALUE OF THE RENTAL RATE

A possible solution consists in the introduction of flexible fare payment of the rental. This paper proposes the final rental rate will be dependent on how the port operator meets certain efficiency clauses (traffic clauses, performance clauses, consume clauses, environment clauses etc.). Such techniques (subsiding or adjusting) are introduced depending on the level of implementation of clauses of efficiency. So:

$$T_f = T_f(p_1, p_2 \dots p_n) \quad (3)$$

where:

$p_{k\ k\in\{1,2,\dots n\}}$ Estimated parameters of the clauses

On the other hand:

$$T_f(p_1, p_2 \dots p_n) = T_n + T_v(p_1, p_2 \dots p_n) \quad (4)$$

where:

T_n Nominal fare obtained as a result of the invitation to tender. It has a fixed value.

$T_v(p_1, p_2 \dots p_n)$ Variable fare.

Accepting that:

$$T_{vk}(p_k) = \begin{cases} T_{vk}\,max & \text{for } p_k \in [0, p_k\,min] \\ -\frac{T_{vk}\,max}{p_k\,min - p_k\,inf}p_k + \frac{T_{vk}\,max}{p_k\,min - p_k\,inf}p_k\,inf + T_{vk}\,max & \text{for } p_k \in [p_k\,min, p_k\,inf] \\ 0 & \text{for } p_k \in [p_k\,inf, p_k\,sup] \\ \frac{T_{kv}\,min}{p_k\,sup - p_k\,max}p_k + \frac{T_{kv}\,min}{p_k\,sup - p_k\,max}p_k\,sup & \text{for } p_k \in [p_k\,sup, p_k\,max] \\ T_{vk}\,min & \text{for } p_k \in [p_k\,max, \infty) \end{cases} \quad (7)$$

where:

$T_{vk}min$ The minimum value of variable rental rate clause introduced by "k" clause

$T_{vk}max$ The maximum value of variable rental rate clause introduced by "k" clause

$p_k min$ Low level

$p_k inf$ Mid-lower level

$p_k nom$ Nominal level

$p_k sup$ Mid-high level

$p_k max$ High level

Graphical representation of this kind of function is shown in Figure 2.

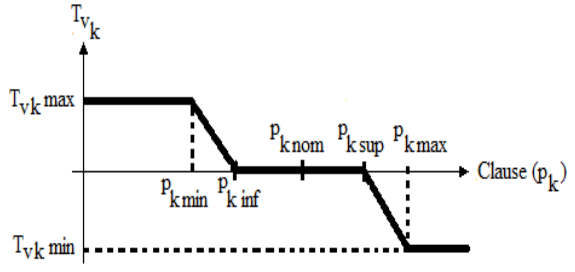

Figure 2
The graph of the function presented by formula (8)

$$T_v(p_1, p_2 \dots p_n) = \sum_{k=1}^{k=n} \alpha_k T_{vk}(p_k) \quad (5)$$

where:

$\alpha_{k\ k\in\{1,2,\dots,n\}}$ Weighting coefficient;

$T_{vk}(p_k)_{k\in\{1,2,\dots,n\}}$ Variable component of rental rate clause introduced by "k" clause.

the formula (4) may be written as:

$$T_f(p_1, p_2 \dots p_n) = T_n + \sum_{k=1}^{k=n} \alpha_k T_{vk}(p_k) \quad (6)$$

In these circumstances it becomes necessary to explicit **the** $T_{vk} = T_{vk}(p_k)\Big|_{k=1,2,\dots,n}$ **functions.**

This study proposes for these functions the next form:

In order to develop a simple procedure for applying the algorithm, formula (6) can be normalized according to formula (9).

$$T_f(p_1, p_2 \dots p_n) = T_n\left(1 + \frac{\sum_{k=1}^{k=n} \alpha_k T_{vk}(p_k)}{T_n}\right) \quad (8)$$

Obvious, this relation may be rewritten as follows:

$$T_f(p_1, p_2 \dots p_n) = T_n\left(1 + \sum_{k=1}^{k=n} \alpha_k \frac{T_{vk}(p_k)}{T_n}\right) \quad (9)$$

At this point it is interesting to analyze how to make the functions (10) more explicit.

$$\frac{T_{vk}}{T_n} = \frac{T_{vk}(p_k)}{T_n}\Big|_{k=1,2,\dots,n} \quad (10)$$

Normalizing both abscissa and ordinate relation (10) becomes:

$$\frac{T_{vk}}{T_n} = \frac{T_{vk}}{T_n}\left(\frac{p_k}{p_k\,nom}\right)\Big|_{k=1,2,\dots,n} \quad (11)$$

where:

$p_k nom$ The accepted nominal level for clause "k";

In these conditions (8) becomes:

$$\frac{T_{vk}}{T_n}\left(\frac{p_k}{p_k nom}\right)=\begin{cases}\dfrac{T_{vk}\,max}{T_n} & \text{for } \dfrac{p_k}{p_k nom}\in\left[0,\dfrac{p_k\,min}{p_k nom}\right]\\[2ex] -\dfrac{\frac{T_{vk}\,max}{T_n}}{\frac{p_k\,min}{p_k nom}-\frac{p_k\,inf}{p_k nom}}\dfrac{p_k}{p_k nom}+\dfrac{\frac{T_{vk}\,max}{T_n}}{\frac{p_k\,min}{p_k nom}-\frac{p_k\,inf}{p_k nom}}\dfrac{p_k\,inf}{p_k nom}+\dfrac{T_{vk}\,max}{T_n} & \text{for } \dfrac{p_k}{p_k nom}\in\left[\dfrac{p_k\,min}{p_k nom},\dfrac{p_k\,inf}{p_k nom}\right]\\[2ex] 0 & \text{for } \dfrac{p_k}{p_k nom}\in\left[\dfrac{p_k\,inf}{p_k nom},\dfrac{p_k\,sup}{p_k nom}\right]\\[2ex] \dfrac{\frac{T_{kv}\,min}{T_n}}{\frac{p_k\,sup}{p_k nom}-\frac{p_k\,max}{p_k nom}}\dfrac{p_k}{p_k nom}+\dfrac{\frac{T_{kv}\,min}{T_n}}{\frac{p_k\,sup}{p_k nom}-\frac{p_k\,max}{p_k nom}}\dfrac{p_k\,sup}{p_k nom} & \text{for } \dfrac{p_k}{p_k nom}\in\left[\dfrac{p_k\,sup}{p_k nom},\dfrac{p_k\,max}{p_k nom}\right]\\[2ex] \dfrac{T_{vk}\,min}{T_n} & \text{for } \dfrac{p_k}{p_k nom}\in\left[\dfrac{p_k\,max}{p_k nom},\infty\right)\end{cases} \tag{12}$$

The graphical representation of this function is shown in Figure 3.

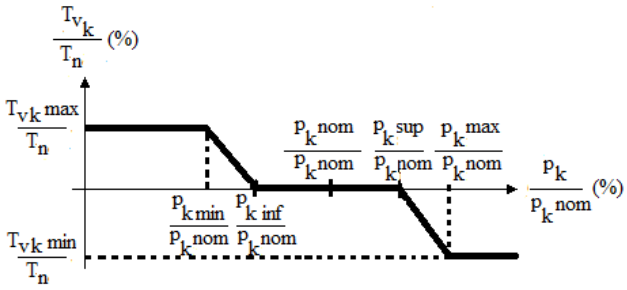

Figure 3 Graphical representation of function (13)

In practical situations such functions are difficult to implement. In these cases it is preferred tabulating them. Starting from the function (12), a relatively convenient tabular solution of it is shown in Figure 4. One can see that besides the five levels for the clause parameter (min. low, nominal, high and max.) an increment for the level is proposed. In the same time, talking about the rental rate, besides the three level (max, nominal and min), an increment is also proposed.

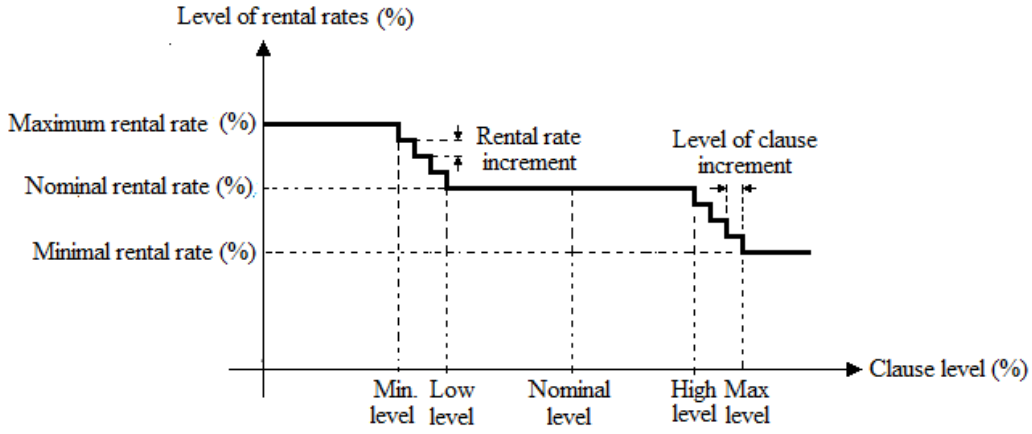

Figure 3 Tabular solution of the function (13)

5. CONCLUSIONS

This approach enables the implementation of a transparent process on rental rate evaluation in a port. It can be seen that in this way one can introduce clauses of efficiency in the rental price. Thus port operator becomes a partner of the administration. Because the rent can be adjusted according to achievements it can receive certain discounts.

In a subsequent paper, the procedure of determining the thresholds between the different levels will be developed.

6. REFERENCES

[1] **** Law 108 of 03.06.2010 approving GEO no. 86/2007 amending and supplementing Government Ordinance no. 22/1999 on the administration of ports and waterways and shipping activities carried out in ports and waterways, act repealed Ordinance no. 131/2000.*

[2] **** Order no. 1286/2012 for the approval of the lease naval transport infrastructure in public ownership of the state and it is leased to port administrations and / or inland waterways.*