Classification After Three Significant Criteria and Calculation of the Frequencies for Direct Procurement Deficiencies, Appealed in the Audit Engagement

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Abstract

The risks of the direct purchase in the SEAP are often repetitive, with a certain frequency.

In order to build a significant econometric model for analyzing the direct purchases in the SEAP (Electronic System for Public Procurement) a series of calculations and consolidations are required to be feasible and to provide useful information for building an econometric model.

Key words: costs, value, FIAP (identification and analysis sheets), SEAP (Electronic System for Public Procurement).
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1. Introduction

On the SEAP market (The Electronic System of Public Procurement), as in any market, the demand meets the supply, the buyer (public entities) meets the supplier of goods/services/works (companies). As in any market, there is a competition in SEAP that enhances the buyers, but there is also a risk, as well. A type of purchase used by public institutions is the direct purchase of products from small-scale, or which are used infrequently enough that it does not fall within any of the procurement procedure stipulated by the public procurement act.

To study the risks of direct purchase, the issues listed in 100 FIAP (record identification and analysis of the problem) were firstly centralized according to the results from the work of a public internal auditor. Then, the FIAPs were chosen by the method of mechanical selection, being arranged in the order of their occurrence in time (which provides an initial condition of random choice). After that, all the fourth FIAPs were extracted, until completion of the required number of 100 sheets, which will represent the working sample for the study. It should be made clear that for each FIAP the additional costs arising from the materialisation of risks (without these risks to be identified and stated so far) were estimated as accurately as possible. To determine these additional costs the following procedures were done:

- an average net salary of reference of 2000 lei/month was taken into consideration, for which an average cost of 11.36 lei/working hour results from the accounts;
- the costs of transportation of packages expedition took into consideration the standard price charged by the Romanian Post, at some point, of 10 lei/kg;
- the expenses for return of non complying or damaged goods have been fully covered, following the payment of invoices;

- carrying out a necessary paper has been roughly equivalent to one hour of additional work, respectively to 11.36 RON/paper;
 - the estimated cost of consumables was established (for example, the toner required for print/copy was estimated at 20 bani/printed page).

The summarization of the data for those 100 FIAPs was done in a table whose columns have the following meaning:

The 1st column: "The number of the criterion";

The 2nd column: "The product name" – it is the name of the product as it is specified in the SEAP;

The 3rd column: "The product cost in SEAP" – it is the unit cost of the product, in lei/unit, the unit cost of the product includes VAT, in the amount of 19%;

The 4th column: "The required quantity" - represents the quantity ordered by the hospital in a single transaction;

The 5th column: "The total cost of the product" - represents the amount of traded products and results from columns 3 and 4;

The 6th column: "Other expenses" - represent the additional cost with their specification on the types of activities it generates;

The 7th column: "Total other expenses" - represents the total additional cost specified in the previous column, the amount in this column represents the amount spent by the hospital to purchase additional products, and can be considered the loss of the hospital in the transaction;

The 8th column: "The overall cost/product" – it is the total amount spent by the hospital for purchasing the product concerned and resulting from the sum of the justified expenses from the 5thcolumn and the additional ones in the 7thcolumn.

2. Classification after three significant criteria

From the foregoing, it is considered that the groups are feasible and generating information with the following criteria: "the total cost of the product", "the total expenses", "the overall cost/ product".

In the first phase, based on the assumption of the normality of distribution, the groups will be chosen equally, the number of groups is given by Sturges' formula:

$$n = \frac{x_{max} - x_{min}}{1 + 3,332 \ln N}$$, where:

n – the size of the grouping interval;

x_{max} – the maximum value which is characteristic for the group;

x_{min} – the minimum value which is characteristic for the group;

N – the total number of the observations (of the FIAP-s; N=100).

a) For the criterion "the total cost/ product":

x_{max} = 5397 lei (FIAP no.37, The standard strain „*Streptococcus pneumoniae*")

x_{min} = 36 lei (FIAP no.13, "*Environment - Fuxin*")

ln 100 = 4,605

A size „n" of the range of the group is obtained with these data:

$$n = \frac{5397 - 36}{1 + 1,332 x 4,605} = \frac{5361}{7,13386} = 751,89 lei$$

It follows a size of the group range of 750 RON.

For more detailed observation data from the 100 FIAPs, it reveals that there are only two atypical values greater than 3000 lei (FIAPs no. 37 and 49), the others grouping towards lower values of the first interval. This leads to another approach, the choice of a smaller length of the projection group, the two atypical values being included in an open group on the upper edge of the values. After these observations, the organization of the data in the total cost of the product is shown in table no. 1, as it follows:

Table no. 1 Organizing data by the total cost of the product

Nr. Crt.	Groups of total cost/product (lei)	Mid range (x_i)	The absolute frequency (f_i)	The relative frequency (f_{ri}) %	The cumulative frequency (f_{ci})
1.	0 – 500	250	29	35,80	29
2.	500 – 1000	750	13	16,0	42
3.	1000 – 1500	1250	16	19,75	58
4.	1500 – 2000	1750	13	16,05	71
5.	2000 – 2500	2250	5	6,17	76
6.	2500 – 3000	2750	3	3,70	79
7.	above 3000	3250	2	2,47	81
TOTAL			81	100,00	

Source: own processing

b) For the criterion „total other expenses", the minimum and the maximum values are as follows:

x_{min} = 15,26 lei (FIAP no.40, The standard strain „*Borrelia Burgdorferi*")

x_{max} = 217,04 lei (FIAP no.18, 19, 20 „*Environment Lugol*")

A careful observation of the data shows, in this case, an anomaly, there are only three comments, accumulated from 3 FIAPs, with values of the criterion "total other expenses" more than 100 lei. Placing them in the group under these conditions they will totally overturn the meaning of the group. The output from this junk can be done by dividing the expenses among FIAPs and by registering them as such; for example, a value of "total other expenses" for the "average" Mueller-Hinton 167.04 lei, FIAP will be divided on the sheets 10, 11, 12, resulting in three observations with values of about 55.70 lei, this operation approaching the scientific truth more than the original.

For compatibility reasons when searching for possible correlation, the number of groups should be still 7. With these remarks, the group after "total other expenses" is presented in the table no. 2.

Table no. 2 Organizing data by the "total other expenses"

Nr. Crt.	Groups of total cost/product (lei)	Mid range (x_i)	The absolute frequency (f_i)	The relative frequency (f_{ri}) %	The cumulative frequency (f_{ci})
1.	15 – 27	21	19	22,62	19
2.	27 – 39	33	20	23,81	39
3.	39 – 51	45	10	11,90	49
4.	51 – 63	57	11	13,10	60
5.	63 – 75	69	15	17,86	75
6.	75 – 87	81	4	4,76	79
7.	87 – 99	93	5	5,95	84
TOTAL			**84**	**100,00**	

Source: own processing

c) Organizing data in a summarizing table of the FIAPs, following the criterion „overall cost/product" involves the division into 7 groups, too, in order to facilitate the processing and the subsequent comparisons of the research.

The minimum and the maximum values are as follows:

x_{min} = 91,45 lei (FIAP no.13, „*Environment – Fuxin*")

x_{max} = 5468,75 lei (FIAP no.37, The standard strain „*Streptococcus pneumoniae*")

The same variation ranges as in the first groups (after the total cost of the product) will be set for consistency in the development of the study, the results are grouped within table no. 3.

Table no. 3 Organizing data by the "overall cost / product"

Nr. Crt.	Groups of total cost/product (lei)	Mid range (x_i)	The absolute frequency (f_i)	The relative frequency (f_{ri}) %	The cumulative frequency (f_{ci})
1.	0 – 500	250	26	32,10	26
2.	500 – 1000	750	15	18,52	41
3.	1000 – 1500	1250	14	17,28	55
4.	1500 – 2000	1750	14	17,28	69
5.	2000 – 2500	2250	7	8,64	76
6.	2500 – 3000	2750	3	3,70	79
7.	above 3000	3250	2	2,47	81
TOTAL			**81**	**100,00**	

Source: own processing

3. Conclusions

In the case study undertaken on the basis of FIAPs, it was found that most of the direct purchases (29 cases) were those which are within the range of the lowest total cost (0-500 lei). The fact that most of the direct purchases from the time interval studied are within the range of the lowest cost, verifying the legality of the purchases of that institution and that most of the products necessary for the institution are actually covered by a procedure according to the Public Procurement Law, and through direct purchase only products were purchased as insignificant cost or who is not a frequent necessity in that institution. Through the direct purchase only insignificant products as cost were purchased or which are not a frequent necessity in that public institution. The criterion "total other expenses" shows that the highest frequency of cases is contained in one of the smallest ranges of 27-39 lei; it foreshadows the idea that if risks occurred, they did not have negative economic consequences too high or more, for the institution. The overall cost/product includes the total cost and "the total other expenses" and the study undertaken shows that most cases are between the lowest: between 0-500 lei, which makes plausible the idea that direct purchases were carried out in that institution, in terms of efficiency.

4. References

- Law no. 98/2016 on public procurement
- GEO no. 34/2006 on the assignment of public procurement contracts, on the concession contracts of public works and service concession
- Law no. 672/2002 on public internal audit
- Dec.no. 1.086/2013 approving the General Rules concerning the exercise of the public internal audit activity
- The Common Order no. 543/2013 approving the Guide on the main risks identified in public procurement and the European Commission's recommendations to be followed by the management authorities and intermediate bodies in the process of vetting procedures for public procurement
- GEO no. 13/2015 on the establishment, organization and functioning of the National Agency for Public Procurement