Essential issues of procurement procedures.
Supplier fraud during the procurement procedure using commercial offers scoring technique

The main procurement procedure stage is participants' commercial offers evaluation and the choice of the supplier offering the best terms. The commercial bids evaluation can be made using the scoring method.

Of course, the customer always provides complete information in the procurement invitation including calculating method of commercial bids scoring. After the scoring mechanisms analysis any of the participants can take specific steps as legitimate as probably not legitimate for his proposal to receive the highest possible score.

If the participant self-involved in the procurement procedure he is able to inflate the natural indicators of his commercial bid for all the scoring criteria in order to receive the highest score.

In this case the customer should use the criteria that can be checked, i.e. all the submitted data on the evaluation criteria has to be confirmed by corresponding documents.

The most interesting case is when the supplier involved in the procurement procedure using two companies. The first one is the primary company and the second one is the false. The false company does not aim the contract obtaining. It is used to get more scoring by the main company and/or to get lower scoring by the other participants.

Let's consider these possibilities using three methods of commercial bids scoring which are used in Russia and the EU and advanced method using.

The first method is a method presented in "Methodological recommendations for scoring of tender bids and suppliers qualification participating in the orders placing contests for goods supply for state needs" according to the Ministry of Economy of the Russian Federation letter dated June 2, 2000 №AS-751/4-605 (hereinafter - the methodology of the Ministry of Economy of the Russian Federation).

According to the methodological recommendations each natural indicator of particular supplier commercial bid on valued criterion (hereinafter - commercial bid indicator) gets a mark (hereinafter – scoping index) on a ten point scale. With this purpose of commercial bids indicators for certain criteria are ranked for all suppliers. The worst indicator is assigned one point, the better - ten points, and interpolation method using in the 1 - 10 points range allows to determine these indicators score for other suppliers.

In this case j-th index scoring for the i-th supplier for the quantifiable indicators is determined by the following formula:

$$B_{ij} = 1 + \frac{N_{ij} - N_{worj}}{N_{besj} - N_{worj}} * (10 - 1)$$

where:

B_{ij} - j-th index scoring for the i-th supplier;

N_{ij} - evaluated j-th indicator value for the i-th supplier in physical units;

N_{worj} - the worst evaluated j-th indicator value among all suppliers in physical units;

N_{besj} - the best evaluated j-th indicator value among all suppliers in physical units.

For not quantifiable indicators index scoring is determined on the expert assessments method basis which also estimates in 1 - 10 points range.

Later after score of all suppliers commercial indicators for all criteria a total commercial bids score of the i-th supplier is determined by the formula:

$$B_{i\Sigma} = \sum_{j=1}^{n} \beta_j * B_{ij} \le 10$$

where:

β_j - j-th criterion specific weight coefficient of the share of the reflecting the relative criteria importance in accordance with the procurement procedure objectives, in this case the sum of specific weight coefficients of all criteria is equal to one;

n – the number of evaluated criteria.

The winner is the supplier who has received the highest index scoring for his commercial bid.

The second method is the method presented in the «Practical Guide to contract procedures for European Union external actions » developed on the basis of EU and EDF Financial Regulations, hereinafter - the methodology of the EDF EU.

This method is similar to the Ministry of Economy of the Russian Federation methodology. It also provides the need to develop criteria for commercial bids evaluation with the specific weight coefficient definition for the each criterion, the need for each supplier commercial bids scoring for each criterion, as well as the need to determine the total commercial bids score.

The principle difference of this method from Ministry of economy of the Russian Federation method are other formulas for j-th indicator scoring for the i-th supplier for quantifiable indicators.

This method does not automatically assigns one point to the worst indicator value but provides calculation of the j-th indicator for the i-th supplier scoring under the following formulas:

- in case, when the worst index value is less than his best values:

$$B_{ij} = 10 * \frac{N_{ij}}{N_{besj}}$$

- in case, when the worst index value is greater than his best values:

$$B_{ij} = 10 * \frac{N_{besj}}{N_{ij}}$$

The rest of the calculation algorithm and the formulas used are similar to algorithm and formulas of the Ministry of economy of the Russian Federation methodology.

The third method is the advanced method presented in the *European Applied Sciences Scientific Journal, #2, 2013*.

Let's consider possible suppliers fraud using the following example.

Example 1.

Let's take the case where during commercial bids according to «The warranty period» criterion 6 suppliers presented their bids with the following physical indicators (table 1). The largest commercial bid natural indicator is the best indicator.

Table № 1

Criterion	Supplier					
	№ 1	№ 2	№ 3	№ 4	№ 5	№ 6
The warranty period, month	12	12	18	20	22	24

Let's calculate the estimates received by suppliers according to all three methods and present the results in tabular form.

Table № 2

Methodology	Supplier					
	№ 1	№ 2	№ 3	№ 4	№ 5	№ 6
Scoring according to the Ministry of Economy of Russian Federation methodology	1	1	5,5	7	8,5	10
Scoring according the methodology of the EDF EU	5	5	7,5	8,33	9,17	10
Scoring according the advanced method	5	5	7,5	8,33	9,17	10

Supposably supplier 1 and supplier 2 are «the one side players». The supplier 1 aims to get the contract. He wants to reduce the competitors scoring for this criterion because he does not have this criterion advantage over other

participants. Supplier 1 exposes the commercial bid of supplier 2 with unreal warranty period which is 48 months.

Let's see how participants score changes considering the commercial bid of the Supplier 2 (tables 3 and 4).

Table № 3

Criterion	Supplier					
	№ 1	№ 2	№ 3	№ 4	№ 5	№ 6
The warranty period, month	12	**48**	18	20	22	24

Let's calculate all suppliers scores according to all three methods and present the results in tabular form. At the same time we specify the previous one value.

Table № 4

Methodology	Supplier					
	№ 1	№ 2	№ 3	№ 4	№ 5	№ 6
Scoring according to the Ministry of Economy of Russian Federation methodology	**1** *(1)*	**10** *(1)*	**2,5** *(5,5)*	**3** *(7)*	**3,5** *(8,5)*	**4** *(10)*
Scoring according the methodology of the EDF EU	**2,5** *(5)*	**10** *(5)*	**3,75** *(7,5)*	**4,17** *(8,33)*	**4,58** *(9,17)*	**5** *(10)*
Scoring according the advanced method	**2,5** *(5)*	**10** *(5)*	**3,75** *(7,5)*	**4,17** *(8,33)*	**4,58** *(9,17)*	**5** *(10)*

Thus according to the first method which proved to be the most inaccurate the Supplier 1 score has not changed after warranty period increasing by Supplier 2. And the competitors received significantly lower score.

According to the second and the third method the Supplier 1 and the competitors score 2 times decreased after warranty period increasing by Supplier 2. However initially Supplier 1 score was significantly lower than competitors scores. So natural points number that competitors lost is more than the points number that Supplier 1 lost.

The same situation we can see for criteria for which the greatest natural bid indicator is the worst.

Example 2.

Let's take the case where during commercial bids assessment according to «The delivery time» criterion 6 suppliers presented their bids with the following natural indicators (table 5.)

Table № 5

Criterion	Supplier					
	№ 1	№ 2	№ 3	№ 4	№ 5	№ 6
The delivery time, week	12	12	11	10	9	8

For the same purposes Supplier 1 exposes   Supplier 2 commercial bid with minimum delivery term which is 1 week (table 6.)

Criterion	Supplier					
	№ 1	№ 2	№ 3	№ 4	№ 5	№ 6
The delivery time, week	12	**1**	11	10	9	8

Let's calculate the participants score change with Supplier 2 new bid. Also we would like to mention the score value for the initial calculation.

Table № 7

Methodology	Supplier					
	№ 1	№ 2	№ 3	№ 4	№ 5	№ 6
Scoring according to the Ministry of Economy of Russian Federation methodology	**1** *(1)*	**10** *(1)*	**1,82** *(3,25)*	**2,64** *(5,5)*	**3,45** *(7,75)*	**4,27** *(10)*
Scoring according the methodology of the EDF EU	**0,83** *(6,66)*	**10** *(6,66)*	**0,91** *(7,27)*	**1** *(8)*	**1,11** *(8,89)*	**1,25** *(10)*
Scoring according the advanced method	**0,83** *(6,66)*	**10** *(6,66)*	**1,67** *(7,5)*	**2,5** *(8,33)*	**3,33** *(9,16)*	**4,17** *(10)*

Thus we have the same situation as for the first method which is the most inaccurate. After the delivery term increasing by Supplier 2 the score of Supplier 1 has not changed and the competitors received significantly lower assessment.

According to the second method after the delivery term increasing by Supplier 2 the score of Supplier 1 and competitors score significantly decreased. However the absolute change of Supplier 1 score is equal to 6,66 – 0,83 = 5,83 which is significantly below the absolute change of competitors score. For example the absolute change of Supplier 6 score is equal 10 – 1, 25 = 8,75.

The third method proved perfect for this case when the largest commercial bid natural indicator of the supplier is the worst. This is because score decreasing for all participants was equal to the same amount. The Supplier 1 change is 6,66 - 0,83 = 5,83, the Supplier 3 change is 7,5 - 1,67 = 5,83, the Supplier 4 change is 8,33 - 2,5 = 5,83, the Supplier 5 change is 9,16 - 3,33 = 5,83 and the Supplier 6 change is 10 - 4,17 = 5,83. This fact shows that any excessive changes introduction in the range of the actual indicators values would not change the score difference.

However this case is the most important because the most significant criteria are always associated with cost. And this is the case when the largest natural commercial bid indicator of the supplier is the worst and the lowest indicator is the best.

Thus none of the three scoring methods is not absolutely resistant to the suppliers fraud. At the same advanced method is the most accurate.

In conclusion it is worth noting that we should always pay attention to the participants bids that are significantly different from the others. Before suppliers scoring you should ensure that the participants intended to deliver products according such terms and conditions and the collusion absence between the participants.