Essential issues of commercial offers comparison during procurement procedures

In most cases procurement procedures holding on a competitive basis by organizations has standardized stages. One of these stages is the stage of commercial bids comparison and evaluation.

If individual commercial offers are presented taking into account that the transportation costs are included in goods cost of shipping this product directly to the buyer, and some commercial offers are presented on the terms of shipment and the buyer has to bear the cost of delivery from the supplier's warehouse, the direct comparison of commercial offers prices is not correct in this case.

Correct price comparison is possible when calculating transportation costs incurred by the buyer and adding these costs to the goods price. In case of several headings purchasing transportation costs are distributed among all the headings in one of the possible ways.

Adhering to this policy is a rather complicated task in some cases.

In case of purchasing more than one heading the most acute problem is distribution of transportation costs incurred by the buyer caused by goods delivery at his own expense on the terms of self-delivery from the supplier's warehouse, and adding these costs to the goods price. At the same time structure of these transportation costs distribution to headings may be different.

Let us consider the following example.

There are five purchased headings and provided by the supplier prices on the terms of self-delivery from the supplier's warehouse. Besides to demonstrate the existing dependencies goods price for each item is taken with an increase of single-order of magnitude compared to the previous item goods price.

Also we have calculated transportation costs incurred by the buyer due to these goods delivery at his own expense. In this case these costs are constant for any number of shipped goods, i.e. items number that has to be delivered (one item or all five items depending on the procurement procedure results) is not significant.

Let us provide the initial data in the following table.

Table № 1

№	Item	Quantity	Price on the terms of self-delivery, USD
1	Item № 1	1	1
2	Item № 2	2	10
3	Item № 3	3	100
4	Item № 4	4	1 000
5	Item № 5	5	10 000
Transportation cost, USD.			100

Available transportation costs need to be distributed and the offered prices to be lead to the conditions of including transportation costs in the goods price.

Let us examine possible distribution variants.

1. Specific distribution per positions unit

Transportation costs assignment to the purchased goods cost may be made by specific distribution of these costs per purchased commodities heading unit.

Let us consider the goods pricing mechanism adding specific transportation costs as exemplified above.

The transportation costs value which is 100 USD in this example is divided by the headings total number, which is 5 in this example, and it makes additional positional shipping costs for each item that will make 20 USD.

Next these costs which are common for the total goods amount purchased on this position are divided by the purchased this item goods number and get additional unit transportation costs.

These additional specific transportation costs are added to the price and make the price taking into account transportation costs.

Additionally you can estimate the price percent increase in relation to the original price on the terms of self-delivery. The data is presented in table № 2.

Table № 2

№	Item	Quantity	Price on the terms of self-delivery, USD	Additional positional shipping costs, USD	Additional specific transportation costs, USD	Price taking into account transportation costs, USD	Price percent increase, %
1	Item № 1	1	1	100/5=20	20/1=20	1+20=21	2 000
2	Item № 2	2	10	100/5=20	20/2=10	10+10=20	100
3	Item № 3	3	100	100/5=20	20/3=6,67	100+6,67=106,67	6,67
4	Item № 4	4	1 000	100/5=20	20/4=5	1 000+5=1 005	0,5
5	Item № 5	5	10 000	100/5=20	20/5=4	10 000+4=10 004	0,04

Correctness confirmation of the above mentioned calculation is the difference between all goods total value with regard to the number calculated according to prices taking into account transportation costs, and all goods total value with regard to the number calculated according to the initial prices on the terms of self-delivery. This difference should be equal to the existing transportation costs, i.e. 100 USD.

All goods total value, calculated according to the initial prices:

*1*1 + 2*10 + 3*100 + 4*1000 + 5*10000 = 54 321 USD*

All goods total value, calculated according to prices taking into account transportation costs:

*1*21 + 2*20 + 3*106,67 + 4*1005 + 5*10004 = 54 421 USD*

Thus, the difference between these two values equal to 100 USD confirms the calculations correctness.

As you can see this method provides a significant price increase in cases when transportation costs are comparable to the price or exceed it on the terms of self-delivery. At the same time this method can be used in the case of goods

procurement with the same order prices and significantly lower transportation costs.

2. Specific distribution per goods amount unit

Transportation costs assignment to the purchased goods cost may be made by specific distribution of these costs per purchased goods amount unit.

Let's consider the pricing formation mechanism with the addition of specific transportation costs as in the same example.

The transportation costs value which is 100 USD is divided by the purchased goods total number which is 1+2+3+4+5=15 pcs. in this example and it makes additional specific transportation costs for each item.

These additional specific transportation costs are added to the price and make the price taking into account transportation costs.

You can also optionally estimate the percent price increase in relation to the initial price on the terms of self-delivery. The data is presented in table № 3.

Table № 3

№	Item	Quantity	Price on the terms of self-delivery, USD	Additional specific transportation costs, USD	Price taking into account transportation costs, USD	Price percent increase, %
1	Item № 1	1	1	100/15=6,67	1+6,67=7,67	667
2	Item № 2	2	10	100/15=6,67	10+6,67=16,67	66,7
3	Item № 3	3	100	100/15=6,67	100+6,67=106,67	6,67
4	Item № 4	4	1 000	100/15=6,67	1 000+6,67=1006,67	0,667
5	Item № 5	5	10 000	100/15=6,67	10 000+6,67=10006,67	0,0667

All goods total value calculated according to the prices taking into account transportation costs:

1*7,67 + 2*16,67 + 3*106,67 + 4*1006,67 + 5*10006,67 = 54421 USD

This method gives a slightly smaller prices increase in the same cases that the previous method. Thus, this can be also used in the same cases as the previous one: the goods procurement with the same order prices and significantly lower transportation costs.

3. Specific distribution per goods cost unit

Transportation costs assignment to the cost of purchased goods may be made by specific distribution of these costs per goods cost unit.

Let us consider the pricing mechanism with the addition of specific goods transportation costs as it is in our example.

The transportation costs value which is 100 USD in this example is divided by the goods prices total sum for each item excluding the amount which is 1 + 10 + 100 + 1 000 + 10 000 = 11 111 USD in this example and makes additional positional transportation costs per 1 USD of goods price, which will make 0.009 USD.

Next these costs that fall to 1 USD of goods price are multiplied by the initial price on the terms of self-delivery and divided by the goods number according to this position. So we have an additional specific transportation costs.

These additional specific transportation costs are added to the price and make the price taking into account transportation costs.

Additionally the price percent increase is estimated in relation to the initial price on the terms of self-delivery. The data is presented in table № 4.

Table № 4

№	Item	Quantity	Price on the terms of self-delivery, USD	Additional positional transportation costs, USD.	Additional specific transportation costs, USD	Price taking into account transportation costs, USD	Price percent increase, %
1	Item № 1	1	1	100/11 111=0,009	0,009*1/1=0,009	1+0,009=1,009	0,9
2	Item № 2	2	10	100/11 111=0,009	0,009*10/2=0,045	10+0,045=10,045	0,45
3	Item № 3	3	100	100/11 111=0,009	0,009*100/3=0,3	100+0,3=100,3	0,3
4	Item № 4	4	1 000	100/11 111=0,009	0,009*1000/4=2,25	1 000+2,25=1002,25	0,225
5	Item № 5	5	10 000	100/11 111=0,009	0,009*10000/5=18	10 000+18=10018	0,18

All goods total value, calculated according to the prices taking into account transportation costs:

*1*1,009 + 2*10,045 + 3*100,3 + 4*1002,25 + 5*10018 = 54 421 USD*

This method distributes the transportation costs with the most uniform price increase which allows using it in the goods procurement with any prices dispersion.

Thus, as a result of any of these methods application transportation costs are distributed among all headings. Precisely adjusted rates are used further in comparing and selecting the best offer.

After the best offer is selected the specific supplier is awarded only a part of purchased headings in most cases. This leads to calculation error because transportation costs in full were initially distributed among all goods positions and awarded positions do not include transportation costs in full range.

The next transportation costs distribution iteration can solve the problem. Transportation costs will be distributed among goods positions which were awarded to the supplier at the first price comparison. However, this can lead to different awarded positions distribution which in its turn might require further iterations etc.

4. Specialized software

Specialized software development is the final step to the absolute accuracy of finding the most favorable headings awarded to diverse suppliers.

This software will work on the algorithm that will provide search of all possible options of purchased headings awarded to various suppliers.

The final amount of spent money will serve as the profitability criterion of the awarded positions single choice.

Let's consider an illustrative example.

№	Item	Quantity	Price of Supplier A, USD	Price of Supplier B, USD
1	Item № 1	$k1$	$a11$	$a12$
2	Item № 2	$k2$	$a21$	$a22$
3	Item № 3	$k3$	$a31$	$a32$
	Transportation cost		$b1$	$b2$

Let's have a look at all the possible combinations of positions awarded and find the total money amount that should be spent for all the goods procurement subject to the number. The data is presented in table № 6.

Table № 6

№	All the possible combinations of positions awarded	Total cost for Supplier A, USD	Total cost for Supplier B, USD
1	$a11, a21, a31;$	$k1*a11+k2*a21+k3*a31+ b1$	0
2	$a11, a21, a32;$	$k1*a11+k2*a21+ b1$	$k3*a32+ b2$
3	$a11, a22, a31;$	$k1*a11+k3*a31+ b1$	$k2*a22+ b2$
4	$a11, a22, a32;$	$k1*a11+ b1$	$k2*a22+k3*a32+ b2$
5	$a12, a21, a31;$	$k2*a21+k3*a31+ b1$	$k1*a12+ b2$
6	$a12, a21, a32;$	$k2*a21+ b1$	$k1*a12+k3*a32+ b2$
7	$a12, a22, a31;$	$k3*a31+ b1$	$k1*a12+k2*a22+ b2$
8	$a12, a22, a32.$	0	$k1*a12+k2*a22+k3*a32+ b2$

Thus this is a simple task for a PC which produces millions of calculations per second to search all possible options of purchased goods awarded to the different suppliers with final money amount has to be spent for this option combination.

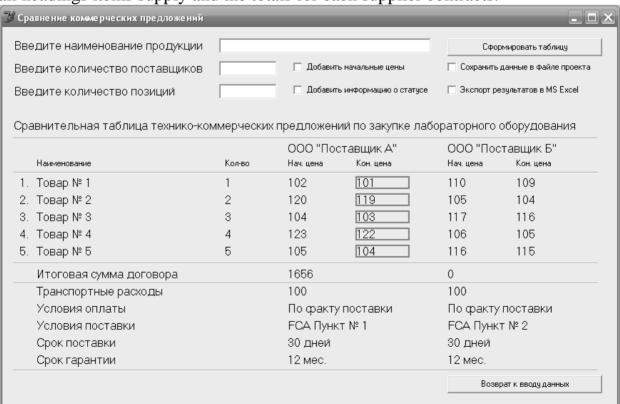Let's consider a possible variant of this software interface.

Initially the software prompts the user to enter the total production name, suppliers and headings number data. Then it gives the option to add the initial prices (for procurement procedures which provide initial prices as well as the prices reduction stage when the final prices are presented). Finally this software gives the ability to save the entered data in the project file and the ability to export results to MS Excel.

The comparative table is formed after the initial data introduction. You enter in the right order purchased product names, quantity, prices and the calculated transportation costs into this table. You can optionally enter the terms of payment and delivery, warranty terms data and any additional information in the notes if necessary.

	Наименование	Кол-во	ООО "Поставщик А" Нач. цена	Кон. цена	ООО "Поставщик Б" Нач. цена	Кон. цена
1.	Товар № 1	1	102	101	110	109
2.	Товар № 2	2	120	119	105	104
3.	Товар № 3	3	104	103	117	116
4.	Товар № 4	4	123	122	106	105
5.	Товар № 5	5	105	104	116	115

Транспортные расходы 100 / 100

☑ Условия оплаты — По факту поставки / По факту поставки

☑ Условия поставки — FCA Пункт № 1 / FCA Пункт № 2

☑ Срок поставки — 30 дней / 30 дней

☑ Срок гарантии — 12 мес. / 12 мес.

☐ Примечание

Расчет

After the introduction of commercial proposals detailed data the calculation is made. The results of this calculation are marked positions with minimal cost of all headings items supply and the totals for each supplier contracts.

	Наименование	Кол-во	ООО "Поставщик А" Нач. цена	Кон. цена	ООО "Поставщик Б" Нач. цена	Кон. цена
1.	Товар № 1	1	102	101	110	109
2.	Товар № 2	2	120	119	105	104
3.	Товар № 3	3	104	103	117	116
4.	Товар № 4	4	123	122	106	105
5.	Товар № 5	5	105	104	116	115

Итоговая сумма договора — 1656 / 0

Транспортные расходы — 100 / 100

Условия оплаты — По факту поставки / По факту поставки

Условия поставки — FCA Пункт № 1 / FCA Пункт № 2

Срок поставки — 30 дней / 30 дней

Срок гарантии — 12 мес. / 12 мес.

Возврат к вводу данных

In the example shown in figures the prices are chosen to show that even a clear visible solution will not always be the most effective.

Thus the second supplier price for positions № 2 and № 4 is significantly lower which may lead to these positions awarding to the given supplier.

Moreover all the three methods distributed costs for the first iteration in such a way that the positions № 2 and № 4 are awarded to the second supplier during further comparison.

However the funds calculation under this awarding option shows that larger final amount of money has to be spent for the all headings purchasing and delivering.

This effect arises due to the fact that we need to incur additional expenses in the transportation costs form which is equal to 100 USD. These costs will ensure the goods delivery from the second supplier warehouse.

Thus this material shows the possibilities of using modern hardware resources that can instantly provide the most effective result.