The secrets of mathematical formulas

There is a lot of noise lately for the correctness of mathematical formulas used in competitions. Are they correct? Are the assumptions on which they are based on, realistic? How possible it is for "loops" to be open and to give the margin to some companies to get a job, over another company?

Next, we will mention a series of simple syllogisms.

One formula often used in open or closed competitions, where criterion is the most advantageous offer is:

$TS = g1*Tx/Tmax + g2*Cmin/Cx$

Where:

TS: Total score
g1: Gravity rate of technical/qualitative characteristics
Tx: Technical score of company x
Tmax: Maximum Technical Score
g2:
Gravity rate of cost (or a total Financial Quote)
Cmin: Minimum offered cost
Cx: Cost charged by company x
Suppose we make a supply where:
g1: 0,6
Tmax: 100
g2: 0,4
The above rates are quite usual in market.

Provided that the competition is open or closed, the participants shall submit their financial offers in an envelope and the evaluation commission will open simultaneously all the envelopes.

Here is the big secret!

Although the commission tries to secure the impartial process, the truth is that the result is corrupted by the admission that all offers are submitted simultaneously-so they do not affect each other- while Cmin is mathematically defined at point zero of the procedure.

In particular, let's watch the following example:

Company A quote:
Tx=100 (as defined by technical evaluation commission)
Cx=700,000 euros
Company B quote:

Tx=90 (as defined by technical evaluation commission)
Cx=590,000 euros

The companies' scores as emerge from the above evaluation formula are:

Company A: TS=0.937
Company B: TS=0.940

So, if the commission had no other quotes, the quote of Company B is evaluated as better that this of Company A and is awarded the competition.

Suppose now, there is also a Company C, whose characteristics are:
Tx=70 (as defined by technical evaluation commission)
Cx=420,000 euros

The last Cx rate changes the Cmin rate to 420,000 euros and the new total scores are formed as follows:

Company A: TS=0.840
Company B: TS=0.825
Company C: TS=0.820

So, while the quote of Company C is not competitive, regarding the quotes of companies A and B, however it changes the bidding line and although until now the quote of Company B was considered better that this of company A, suddenly, with the intervention of another company, the quote of company A is considered better!

So, Company A could within specific limits (defined by the gravity rates and acceptable score and cost limits) submit a quote through a company C and corrupt the result
of the competition.

cosmoONE's proposal on this problem is simple and clear:

Open and closed competitions may lead to wrong results.
Organizers shall seek for the really most advantageous offer. Tmax and Cmin shall be defined before the commencement of the negotiations.
Cmin may be defined as start rate of the negotiation, or the minimum financial quote, if submitted before the negotiations as RFQ.
Moreover, the rename of Cmin to Co is proposed, for the avoidance of misinterpretation.

In any case, the participants shall know the real terms on which they compete.
The most effective way to succeed the most advantageous quote is:
To have a competition with negotiation and not open or closed, by submitting one financial quote in closed envelope.
Instead of the above mention formula, we shall use the following:

To conduct Online Auction with Cx as variable (there is no limitation to its use in combination with Tx), in order to achieve transparency, equal terms and substantive competition.

The results of the above mentioned methodology are quite satisfactory, according to its application so far.