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Correction method on fairs' attraction radius

László Kárpáti,

University of Debrecen

Abstract: At auditing a fair the measure and evaluation of the exhibitors' distance is a important task and can be used for further promotion of the fair. In analyzing the attraction radius of different fairs one can discover some figures that may raise questions regarding a simple averaging of the attraction distances. According to the research of the author, the bias in the attraction radius can be caused by to factors: the size of the attraction region and the distance from the region's business center. Authors explored the bias factors and suggest a correction method to remedy it. A theoretical correction model was applied to evaluate three agribusiness fairs. It is established that the corrected attraction radius gives more realistic result than the simple averaging of exhibitors' distance.

1. Introduction, Aims

Calculation of attraction radius and evaluation the attractiveness of a fair can be considered as a routine method nowadays. The basic principle is: the more and longer-distance exhibitors participate in a fair, the bigger is the professional attractiveness of the exhibition. At the auditing of a fair, therefore, the measure and evaluation of the exhibitors' distance is a important task and can be used for the further promotion of the fair. Further advantage is that measuring exhibitors' distance can easily be carried out and interpreted. The average attraction radius especially important in case of exhibitions' comparison, classification and categorization.

In analyzing the attraction radius of different fairs one can discover some figures that may raise question mark regarding a simple averaging of the attraction distances. In case of some exhibition the measured attraction radius was lower or higher than expected in their professional category and the differences were caused by not an incorrect data recording or statistical method. This finding led the author to the conclusion that the traditional measurement of the attraction radius should be critically reviewed and based on that to elaborate a method to correct it. In this article the author makes an experiment to explain the professional results that "different from the expected" and based on that to elaborate a new method that makes the fairs' attraction radius better comparable, especially in international relationship.

2. Review of Literature

Several authors deal with evaluation of attraction radius of fairs / exhibitions / events, one part of the publications does not make distinctions between exhibitors and visitors, but at the other part of relevant publications this distinction exists. The following authors' publications deal with general issues of the attraction radius: *Ali-Knight et al. (2008)*, *Anonymous (2004)*, *Biró (1994)*, *Csizmadia (2004)*, *Fenich (2008)*, *Gauder (2006)*, *Kozma (1999)*, *Masterman – Wood (2008)*, *Robinson – Long (2008)*, *Rutherford Silvers – Jeff Goldblatt (2008)*, *Shone (2008)*.

In connection with exhibitors' attraction radius the following authors' publications contain relevant information: *Arany et al. (2002)*, *Bakos (2004)*, *Faragó (2005)*, *Gyarmati (2005)*, *Járasi (2004)*, *McDonel et al. (2008)*, *Rogers – Davidson (2008)*, *Shone et al. (2008)*, *Tomecskó (2003)*, *Varga (2008)*, *Vatel team (2006)*.

From the literature listed above the publication of *Varga (2008)* has special reference to this paper. Varga evaluates the attraction radiuses of two Hungarian and one Polish fair regarding the exhibitors. One of the Hungarian fairs is the Farmerexpo which is organized in Debrecen once in a year, generally in late August – early September. This fair has an agribusiness character and attracts large number of Hungarian and foreign exhibitors, the participation is between 300 and 400 yearly.

The other Hungarian fair is the OMÉK, organized in Budapest. Its character is also agribusiness (and food) and this fair can be considered as the number one agricultural – agribusiness exhibition in Hungary according to the generally accepted professional opinion. Number of exhibitors in case of the OMÉK is over 500 in average.

Analysis of the exhibitors' attraction radius of the two Hungarian fairs above has brought a surprising result, namely the OMÉK's radius was 140 km, while the Farmerexpo's radius was longer: 177 km, although the number of exhibitors was less in case of the Farmerexpo. This result raises a question about the figures and supervision of nature and measure of the attraction radius.

Varga (2008) examined a Polish agribusiness fair, as well. This fair is organized in Poznan, the average number of exhibitors is around 600. This fair can be compared to Debrecen's Farmerexpo since it is organized not in the business center of the country (Warsaw), and the fair has also a countrywide effect. The measured attraction radius was an average of 364 km, that is more than a double to that of Farmerexpo, although the number of exhibitors was just about 50 per cent bigger. In this case also arises the question, namely: what caused this considerable difference between the average attraction radiuses of the respecting fairs of similar character.

From the contradictory facts described above the author intends to make an experiment to explain this phenomenon's

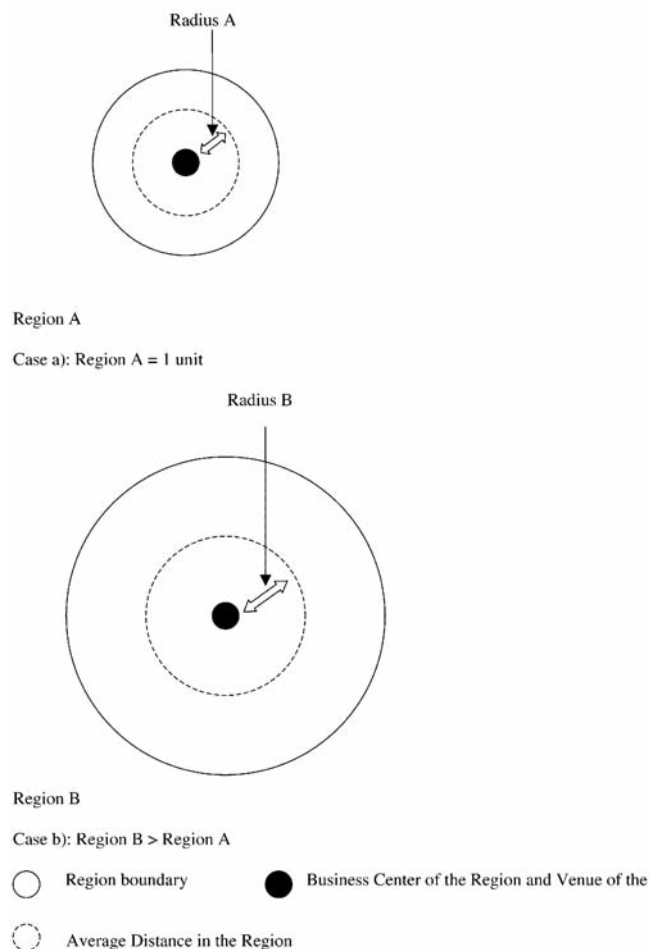


Figure 1. Effect of the Region's Size on Attraction Radius

contradictory nature and to suggest a solution to modify the attraction radius in order for a better comparison.

3. Effect of Size of the Region on the Attraction Radius

The contradiction between the Farmerexpo and Poznan fair described in Point 2, is visualized in Figure 1.

As it can be seen in Figure 1, two regions were visualized: Region A was symbolized by a smaller circle, while Region B by a bigger one. The "region" in this sense means a wider / theoretical maximum attraction distance. In Varga's publication (2008) all of the fairs he examined the region means always the given country, that is Hungary in case of Farmerexpo and OMÉK, and Poland in case of the Poznan fair. If we accept this precondition, than we can make a comparison between the total area of the two countries. Area of Hungary is 93 thousand square km, while the area of Poland is 312 thousands square km. The area ratio of the two countries is 1:3.35, its square root – that refers to the attraction radius – is 1:1.83. It explains the fact that an "average ride" in case of Hungary is about 300 km, but the same figure in Poland is about 600 km. Deriving from this fact, that a so-called "countrywide participation" means

about a double distance in Poland in comparison with that of Hungary.

In Figure 1 the comparison of radius A and radius B shows well this difference, that derives practically from the size differences of the general attraction regions. In comparison of fairs inside a given country it does not cause any problem, but it is worthwhile to take it into account in case of international comparison. To treat this problem described above the author suggests a correction according to the size of the general attraction distance of the given region or country. This correction is shown in Formula 1.

Formula 1

$$BAC = (MAAR / 100) * \left[\left(100 - \left((MAAR^2 * \pi) / (BAR^2 * \pi) \right) * 100 \right) \right] / 100$$

, where

BAC: Business Area Correction, km

MAAR: Measured Average Attraction Radius, km

BAR: Business Area Radius, km

With the help of Formula 1 such a BAC correction distance can be calculated that takes into account the absolute size of the wider attraction region (for example country) and a reduction is applied on the measured attraction radius.

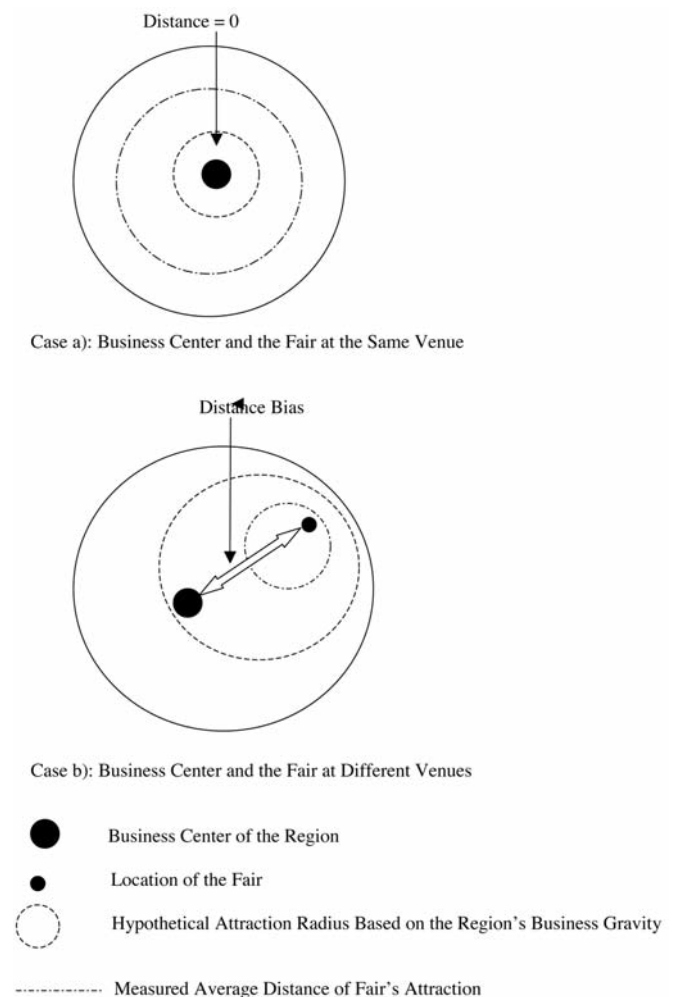


Figure 2. Effect of Business Center Location on the Average Distance

Although using the BAC correction distance is especially advantageous in case of comparison among different countries, but it can be used at evaluation of local or sub-regional fairs / exhibitions, as well. These events are generally closely connected to a settlement or geographical areas and they not have countrywide effect in nature. In this case the generally accepted maximum effective professional attraction radius can be compared with the size of the given country and in this case the attraction radius can be unified inside a given country, as well.

4. Effect of Distance from the Business Center and Its Correction

In Point 2 the attractive radius contradiction between the Farmerexpo and the OMÉK is described. Figure 2 illustrates this situation.

As it can be seen in Figure 2, in case of situation a) the business center of the region (country) and the location of the fair can be found at the same venue or its direct environment. In this case the participating firms can exhibit at their own business headquarters that diminish the average distance considerably.

In case of situation b) of Figure 2, there is a considerable distance between the business center of the region (country) and the venue of the fair. A big proportion of the firms, therefore, have to "relocate" a part of their company to the distant venue of the fair, that is why the attractive radius was increased just by this fact. The suggested correction in connection with the phenomenon described above is shown in Formula 2.

Formula 2

$$BCDC = BCDE * (0.05 + 0.001 * BCER) * MAAR / 100$$

, where BCDC: Business Center Distance Correction, km
BCDE: Business Center Distance from Exhibition, km
BCER: Business Center Exhibition Ratio, %
MAAR: Measured Average Attraction Radius, km

As it can be seen in Formula 2, the correction depends basically from two factors: the distance between the business center and the venue of the fair as well as from the proportion of firms who exhibit from the business center at the distant fair. The constants in Formula 2 were determined on the basis of practical considerations, namely: correction based on the distance was taken into account with a smaller proportion since participation at a distant fair refers to the bigger attractiveness of that fair.

5. Determination of Corrected Attraction Radius

The correction factors described above (in Points 3 and 4) have to be taken into account together during the determination of the final correction distance. The suggested method is the square root average, as it can be seen in Formula 3.

Formula 3

$$CD = BCDC^{\frac{1}{2}} * BAC^{\frac{1}{2}}$$

, where CD: Correction Distance, km
BCDC: Business Center Distance Correction, km
BAC: Business Area Correction, km

With the calculated CD correction distance the measured attraction radius of the fair has to be modified as it can be seen in Formulae 4 and 5.

Formula 4

$$CAR = MAAR - CD$$

, where CAR: Corrected Attraction Radius, km
MAAR: Measured Average Attraction Radius, km
CD: Correction Distance, km
and

Formula 5

$$AR = CAR^2 * \pi$$

, where AR: Attraction Region, km²
CAR: Corrected Attraction Radius, km

As it can be seen above, the correction distance is subtracted from the measured average attraction radius. It means that the modification effect is higher according to the absolute size of the region (country) and the distance between the region's business center and the venue of the fair. If we compare countrywide fairs in the same country, than the correction based on the region's size does not play any role in the calculation, the correction distance will depend on exclusively from the business center distance and the participation rate in the fair from the distant business center.

However, if one wants to make an international comparison of fairs, the correction based on the sizes of the respective countries have to be incorporated into the calculations in all the cases.

In order to carry out the calculations of the Formulae 1–5, a software named: CAR was created by the author and the calculations described above can easily be executed by this software. Furthermore, the correction calculations are shown (Table 1) based on the Varga (2008) article – referred above – in order to demonstrate the use of the correction method.

As it can be seen in Table 1, the OMÉK fair was considered as a basis for the model calculations. The corrected attraction radius was changed a little, just because of the algorithm of the calculation: 137 km against the measured 140 km, that is practically the same distance. In case of the Farmerexpo, however, the corrected result has changed radically: 104 km against the measured 177 km, that is 76 per cent of that of the OMÉK. The reason can be explained exclusively by the fact that 43 per cent of the exhibitors arrived from the distant business center (Budapest, 230 km), and this was not the case at the OMÉK, where the fair's location and the business headquarters are more closely to each-other.

Table 1: Corrected Attraction Radius of Fairs Examined by Varga (2008)

Factor of the calculation	Unit	Fair (average values)		
		OMÉK	FARMER EXPO	POZNAN
Country		Hungary	Hungary	Poland
Area of the country	1000 km ²	93	93	312
Country's attraction radius	km	300	300	600
Venue of the fair		Budapest	Debrecen	Poznan
Business center of the country		Budapest	Budapest	Warsaw
Distance of the business center from the fair	km	1 (technical number)	230	326
Measured participation of firms from the business center	%	1 (technical number)	43	37
Measured average attraction radius	km	140	177	364
Measured average attraction radius index (OMÉK = 100%)	%	100	126	260
Corrected attraction radius calculated by the CAR model	km	137	104	244
Corrected attraction radius index (OMÉK = 100%)	%	100	76	178

In case of the Poznan fair the corrected distance is reduced to 244 km, in comparison with the measured 364 km. By this correction the original 260 per cent attraction radius in comparison with the OMÉK (=100%) was reduced to 178 per cent. In this case not just the distance from the main business center (Warsaw, 326 km) played a role, but the geographical size of Poland against Hungary, as well.

In interpreting the results not just the changes in the distance can be considered important, but rather the ratio between the corrected distances for the sake of comparison. In this way, therefore, the different results can better be compared after filtering out the disturbing technical factors. The main purpose of comparison has to be emphasized in every case because those fairs that do not seem so attractive after the distance correction by the CAR model may found this corrected result to be resentful. That is why it is necessary to show the measured average attraction radius parallel with the corrected attraction radius as well as their ratios, too, in order to obtain a clearer picture about the fairs to be compared.

With the help of the CAR model one can make sample calculations to see how the corrected attraction radius is changing on the change of the participation rate of firms from the distant business center. In Table 2 model calculation results can be found using the average variables of the Farmerexpo as a basis.

As it can be seen in Table 2, ten per cent increased participation rate of exhibitors from the distant business center the per cent results in about 3-5 per cent attraction radius reduction in relationship of Debrecen – Budapest. Naturally, it is a positive fact for the Farmerexpo that quite a

Table 2: Calculation of the Corrected Attraction Radius of Farmerexpo

Proportion of exhibitors from the distant business center (Budapest, 230 km)%	Corrected attraction radius km	Index (measured value = 100%)
10	119	114
20	114	110
30	109	105
40	105	101
43 (measured value!)	104	100
50	102	98
60	98	94
70	94	90
80	91	87
90	88	85

big ratio of exhibitors arrived from the distant business center. The corrected attraction radius just creates an opportunity to measure the attraction radius of fairs organized in different location by a unified method, and by using the CAR model it the comparison will be more realistic. The attraction radius – however – just one element of the effectiveness of the fairs and should not be overestimated anyway.

6. Conclusion

Introduction of the corrected attraction radius alongside with the measured attraction radius creates an opportunity of comparison on unified basis since measured attraction radius is distorted by the absolute size of the region (country) and the effect of venue different from the business center. Using of corrected attraction radius may be justified especially in comparison of fairs of different countries. By the model this correction can easily be calculated that is why its use is suggested for evaluation and auditing of different fairs.

The model theoretically can be suitable for modification of attraction distance of different events, but for events different from fairs a different variant of the CAR model should be used.

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