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Rating and ranking metro areas in the United States and Canada for the arts and recreation

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Abstract. This paper ranks 343 U.S. and Canadian metro areas by a composite index for the arts with nine factors and recreation with 11 factors using data published in *Places Rated Almanac* in 1993. The index methodology, as suggested by the *Human Development Report*, is utilized as a substitute for the simple addition of the separate rankings. Metro areas over 2 million population and in the mideast, far west, and New England were in the top of the scale for the arts. Areas with population range of 1.5 and 2 million and in the far west and Rocky Mountain regions were in the top of the scale for recreation.

1. Introduction

Economists always have been concerned with four questions:

- What should a society produce?
- In what quantities?
- How should it be produced? and
- Who should receive the goods produced?

There is, however, another concern: the geographical perspective. According to Smith (1982, p. 18), it is "a concern with who gets what, where, and how." The 'where' can be interpreted as the difference in the quality of life due to natural and social amenities, a by-product of the place where persons live.

While economic well-being can be measured by per capita income—a measure that is contested by Cobb *et al.* (1995), for instance—no comparable method exists to measure geographical and social amenities. Attempts at such measurements have resulted in devices generally known as *quality of life indices*. One of these is the physical quality of life index (PQLI), developed by the Overseas Development Council (Morris 1979), which is designed to observe the social progress or decline of nations by means other than GNP. A recent variant of this index is the human development index created by the United Nations Development Program (UNDP) published annually beginning in 1991. The quality of life and human development indices are useful research devices that provide information.

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A common fault among regional scientists according to Lipshitz and Raveh (1994) is to assume that regions are homogeneous. Instead, these scientists should emphasize differences in regional socioeconomic and cultural recreational amenities, as observed by Roback (1982), Blomquist *et al.*(1988), Stover and Leven (1992), Clark and Knapp (1995), and Burnell and Galster (1992). Mawson (1995) notes that in the United Kingdom there is a positive relationship between what traditionally is understood as art and popular culture and economic development. Mawson claims that while some attention is paid to the relationships of producer services and tourism to economic development, the culture industry also can contribute to employment, income growth, improvement of the physical environment, and enhancement of the confidence of the community for endogenous development.

The work by Boyer and Savageau (1993) is notable among data providers for the amenities of life in urban areas. This latest in a series of publications entitled *Places Rated Almanac* provides data and rates and ranks 343 American and Canadian metropolitan areas (MSA) for their socioeconomic and cultural and recreational amenities divided into nine categories, each comprising various factors. The major categories are the cost of living, jobs, housing, transportation, education, health care, crime, the arts, recreation, and climate. The ranks of the areas resulting from rating by the nine indicators subsequently are aggregated into a single index by which the urban areas are ordered. To economists, the major criticism of a rating based on simple addition of separate rankings is the implication that persons value each of the factors equally. Furthermore, the adding of ranks may not be statistically meaningful, as Norris and Norris (1986) and Pierce (1985) have shown. The purpose of this study is to provide an alternative methodology to rank the urban areas for the arts and recreation by a scheme developed by UNDP (1995) that utilizes the concept of distance.

2. Data and methodology

The index is compiled using data taken from Boyer and Savageau (1993) for 343 American and Canadian metro areas. For the United States any city with a population of more than 50,000 is included. Also included are urbanized areas composed of one or more towns of at least 50,000 located in a county or counties with a total population of at least 100,000 (75,000 in New England). For Canada, urban areas of at least 100,000 persons qualify.

This study considers only two of the nine indicator categories. The arts and recreation are selected because studies of quality of life in urban areas tend, in general, to ignore arts and recreation. The arts consists of nine factors, and recreation consists of 11 factors as follows:

Arts:

Concert or classical format radio stations,
 Touring artists bookings at local campus and civic auditoriums,
 Resident symphony orchestras,
 Resident opera companies,
 Resident ballet companies,
 Resident professional theaters,
 Nonprofit art museums and galleries, and
 Public libraries.

Recreation:

Public golf,
 Good restaurants,
 Movie theater screens,
 Zoos,
 Aquariums,
 Family theme parks,
 Pari-mutuel betting attractions,
 Professional sports,
 Collegiate sports,
 Miles of ocean or Great Lakes coastlines, and
 Public recreation land.

The arts factors compare the cultural assets of the metro areas by assigning points for the factors. For instance, the metro area receives one point for each performance of a touring fine arts musical group and local resident ensemble. If a nonprofit art museum or gallery among the 1,034 in North America is located within a metro area, the area receives 50 points. Similarly, the points awarded to a metro area within the proximity of a public library is the number of new books for 1,000 residents.

Scores also are awarded for recreational facilities that can be found in the vicinity of a metro area such as quality restaurants, golf courses, movie theaters, and crowd pleasers such as zoos, family theme parks, pari-mutuel betting, and professional and collegiate sports. The ratings are AA, A, B, and C. The points awarded for these ratings differ. For restaurants, a metro area receives AA if there is one quality star for 15,000 residents or less and C when the number of residents exceeds 40,001. For golf, AA is awarded if there is one hole for 1,750 individuals and C when the number of persons exceeds 4,001, and so on.

The 75 metro areas adjacent to metropolitan complexes are eligible for bonus points. The supply of the arts and recreation tend to be spatially concentrated, and consumers who tend to be more dispersed share the amenities provided by the metropolitan complexes.

Using the same scoring assigned by the *Almanac* for the metro areas for the nine factors of the arts category and the 11 factors for the recreation category, the aim is to construct a composite index that combines the two indices to rate the 343 metro areas. For this purpose, let x_{ij} be the given value that metropolitan area j , $j = 1, 2, \dots, 343$, takes for indicator i , $i = 1, 2$. Because x_{ij} s are expressed in different and incomparable units, they first are standardized by the transformation

$$(1) I_{ij} = \frac{\max X_{ij} - X_{ij}}{\max X_{ij} - \min X_{ij}} \quad 0 \leq I_{ij} \leq 1,$$

where $\max X_{ij}$ and $\min X_{ij}$ are the maximum (highest) and minimum (lowest) achievements for all areas, serving as reference points. Thus, for each indicator (the arts, recreation) the reference point is defined to be the top rated area. The value of a particular area is subtracted from the reference point, and the difference is divided by the range of values. An index I_j for area j is constructed as

$$(2) I_j = \frac{1}{2} \sum_{i=1}^2 I_{ij}$$

The values of the index range between 0, indicating that an area had the best performance, to 1.0, indicating that an area had the worst performance. Therefore, the lower the value of the index, the better is the performance. This preserves the concept of distance in that the smaller the number (the shorter the distance), the closer a metro area is to the two dimensional reference point. This is the reasoning for not subtracting I_j in equation (2) from 1.00 as Perrons (1995) does.

Equal weights are assigned to the indicators in equation (2), even though unequal weights can be assigned using a revealed preference approach as demonstrated by Roback (1982) and Blomquist *et al.* (1988). The scores assigned by the *Almanac* for the component factors, however, are maintained. It is conceivable that the weighting of the *Almanac* reflects the revealed preferences of the residents. Even though the computed distances of equation (1) are relative to a chosen two-dimensional reference point, the basis of measurement is absolute because it uses a standard yardstick for all the comparisons. This makes it possible to test a variety of statistical hypotheses.

3. Empirical results

The computation of distances using equation (2) yields scores ranging from a minimum of 0.2426 to a maximum of 0.9999, with a mean $\bar{x} = 0.7868$ and a standard deviation $s = 0.1185$. For $\bar{x} \pm 3s$ the scores should range between 0.4314 and 1.1421. All the distances fall within this range with the exception of New York City, Los Angeles, and San Francisco, ranked first, second, and third, respectively. Table 1 provides a list of the top ranked 50 metro areas, where the two numbers appearing next to an area are the values of the composite index and the rank of the area. (A full list is available on request.)

Table 1. Top 50 U.S. and Canadian metro areas for the arts and recreation (alphabetical order)

Metro area	Index	Rank
Albuquerque, NM	0.6467	41
Atlantic City, NJ	0.6617	49
Baltimore, MD	0.5600	14
Barnstable, MA	0.6340	38
Bellingham, WA	0.5801	24
Boston, MA	0.5783	22
Boulder, CO	0.5846	25
Chicago, IL	0.5604	16
Cleveland, OH	0.6007	27
Eugene, OR	0.5412	11
Fort Collins, CO	0.5209	8
Fresno, CA	0.6632	50
Honolulu, HI	0.6174	33
Houston, TX	0.5641	18
Jacksonville, FL	0.6493	44
Knoxville, TN	0.4725	7
Las Vegas, NV	0.6524	47
Long Island, NY	0.6017	29
Los Angeles, CA	0.2552	2
Miami, FL	0.4533	4
Minneapolis, MN	0.6391	40
Monmouth, NJ	0.6520	46
Naples, FL	0.5288	9
New York, NY	0.2426	1
Norfolk, VA	0.6056	30
North Charleston, SC	0.6179	34
Ocala, FL	0.6503	45
Orange County, CA	0.5563	13
Orlando, FL	0.5972	26
Philadelphia, PA	0.5662	20
Phoenix-Mesa, AZ	0.5645	19
Portland, OR	0.6170	32
Provo-Orem, UT	0.6469	42
Quebec City, PQ	0.5340	10
Rapid City, SD	0.6471	43
Rochester, NY	0.6236	36
Sacramento, CA	0.6224	35
Salinas, CA	0.6007	28
Salt Lake City, UT	0.6328	37
San Diego, CA	0.4534	5
San Francisco, CA	0.3856	3
Santa Barbara, CA	0.5785	23
Seattle, WA	0.4670	6
Tampa, FL	0.6090	31
Toronto, ON	0.5779	21
Tucson, AZ	0.5611	17
Vancouver, BC	0.5416	12
Ventura, CA	0.6358	39
Washington, DC	0.5603	15
West Palm Beach, FL	0.6588	48

Source: David Savageau and Richard Boyer (1993) and calculations from equations (1) and (2)

Table 2. Distribution of U.S. and Canadian metro areas for the arts and recreation by population

Size	343 areas		Top 50 areas	
	Number	Percent	Number	Percent
less than 500,000	239	0.70	12	0.24
500,000-1,000,000	49	0.14	11	0.22
1,000,000-2,000,000	29	0.09	10	0.20
over 2,000,000	26	0.07	17	0.34

Source: David Savageau and Richard Boyer (1993) and calculations from equations (1) and (2)

Table 2 shows the distribution by population categories of the 343 metro areas and the 50 top rated among them for the arts and recreation. The percentage distributions suggest that the arts and recreation are highly related to size. Specifically, sizes over 2 million and those between 1 and 2 million are overrepresented in the top 50, while sizes under half million are underrepresented in the top 50. Similarly, Table 3 shows the distribution of the 343 metro areas by regional categories, arranged according to the Bureau of Economic Analysis' eight U.S. regions classification. Canadian metro areas are classified under Canada. The far west is overrepresented in the top 50, while the Great Lakes is underrepresented. Most other regions have fair representation.

Next the relationship between each of the two indicator components of the index (the arts, recreation) as well as the index with population and region is statistically examined. This time population is classified into 11 categories. For such an examination a one way analysis of variance is deemed appropriate. In this case the primary interest is whether the average score for each of the indicators as transformed by equation (1) as well as the composite index calculated by equation (2) differs significantly among the metro areas by population and region categories. There are three such hypotheses, one for each indicator (the arts, recreation) and one for the composite index. The F-test is used to accept or reject a hypothesis.

For the population category the application of the F-test for equality of means is rejected for each hypothesis with p -value = 0.0. The comparisons of the computed confidence intervals for the means reveal that the metro areas over 2 million occupy a unique position for the arts while metro areas between 1.5 to 2.0 million occupy such a unique position for recreation. For the overall index metro areas over 1.5 million are the leaders. The metro areas of sizes less than 200,000 inhabitants are the least favored. There was a great deal of interlapping of the confidence intervals, indicating that on average the majority of the areas of smaller sizes do not differ significantly from their larger counterparts. Similarly, the test of hypotheses of equality of means by region also is rejected for the arts and for recreation, as well as the index. The comparisons of the confidence intervals reveal that the mideast, Canada, the far west, and New England occupy top positions for the arts; the far west and Rocky Mountain regions occupy the top positions for recreation and for the index.

Table 3. Distribution of U.S. and Canadian metro areas for the arts and recreation by regions

Size	343 areas		Top 50 areas	
	Number	Percent	Number	Percent
New England	19	0.06	2	0.04
Mideast	39	0.11	8	0.16
Great lakes	51	0.15	2	0.04
Plains	29	0.08	2	0.04
Southeast	85	0.25	10	0.20
Southwest	40	0.12	4	0.08
Rocky Mountain	13	0.04	4	0.08
Far west	41	0.12	15	0.30
Canada	26	0.08	3	0.06

Source: David Savageau and Richard Boyer (1993) and calculations from equations (1) and (2)

4. Conclusions

Often monetary measures for goods and services, as exemplified by per capita GNP, are inadequate indicators of human well-being. An important reason is the exclusion of natural and social amenities derived from the place of residence. Quality of life indices are used to fill this gap.

The selection of the form of the index, the variables needed, and the weights assigned to the variables remain subject to controversy and debate. There is no doubt, however, that their construction can be helpful in differentiating entities.

An important common feature in the construction of a quality of life index is the use of socioeconomic data in natural units of goods and services. The form of the index varies. The addition of rank scores is the most frequently used form.

This paper uses data obtained from *Places Rated Almanac* (1993) to demonstrate the construction of an index based on the concept of statistical distance. This characteristic has some attractive features. The most important is the establishment of a measure whereby all the information contained is comparable, and, consequently, it is possible to classify and analyze results on a statistical basis.

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