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I. Introduction

The U.S. society has certainly passed through an industrialization era and seems to be in a great transition period toward a postindustrial stage. Uncertainty and confusion have rolled across the U.S., and a discontent with the quality of life seems to have been growing faster than technological know-how and material wealth in this country. They have developed as a result of conflicting values: "operative values" in the industrial state and the "declared values" important in the founding of our nation. While the former is characterized by the competitive factor, the division of labor, indefinite economic persuasion, the use of the scientific method, and technological advances, the latter is highlighted by concerns with equality, justice, and natural rights such as life, liberty, and the pursuit of happiness.

However, a problem is not likely to be solved until it has been perceived and identified as a problem. Although there exist thousands of decision-makers within the private sector who are able, willing, and devoted to the enhancement of our overall quality of life, they are not certain about the direction that their activities should take, just as many public decision-makers are not always sure about the social, economic, political and environmental impacts of their actions.

In order to promote the general welfare, there is an urgent need for a mechanism which can distinguish better from worse. "For many of the important topics on which social critics blithely pass judgments, and on which policies are made," said Bauer, "there are not yardsticks by which to know if things are getting better or worse [1, p. 20]. As it now stands, the United States has no comprehensive set of social statistics that reflect our changes in values and measure social progress or retrogression. One of the most detrimental features of the social sciences to date has been the absence of any generally acceptable condensed set either of social welfare functions or of social conditions.

The search for social indicators is an attempt to obtain new information that will be useful to evaluate the past, guide the action of the present, and plan for the future. The empirical measures of various levels of social quality of life enjoyed by Americans are aimed at the identification of strengths and weaknesses of our national well-being so that decision-makers, be they public or private, can be assisted as they seek to evaluate, guide, and plan for a better social quality of life. This study represents exploratory efforts to meet these needs.

II. A Social Quality of Life Model

Methodological development of social indicators and interest in the quality of life concept development grew remarkably in the 1960's. A variety of national goals on the social front were set up by President Eisenhower's Commission on National Goals in 1960 [20]. In 1962, the Social Science Advisory Committee (to President Kennedy) urged the establishment of a systematic collection of basic behavioral data for the U.S. Following the studies on social indicators by Bauer [1], and Sheldon and Moore [22], Wilbur Cohen [4], Secretary of HEW, proposed in 1968 the establishment of a Council of Social Advisors to analyze the quality of life in the U.S. The President's Commission on Federal Statistics also accepted the challenge to improve the quality of federal statistics in the 1970's, and new developments in labor statistics, such as employment safety and working conditions, are already underway at the Bureau of Labor Statistics.

The U.S. Environmental Protection Agency (EPA) also made an effort to improve the tools available to decision-makers who are necessarily involved in the quality of life production and the delivery systems. A large-scale symposium on the subject, "The Quality of Life Concept--A Potential New Tool for Decision-Makers," was sponsored by EPA in 1972 [13], which set another significant milestone for quality of life research and the social indicator movement. Two years later, the Office of Management and Budget published Social Indicators, 1973 [23], a book of statistics selected and organized to describe social conditions and trends in the U.S. and the first of its kind to be published by the Federal Government.

None of the above mentioned work has, however, set up a systematic, interrelated approach by which long-term trends as well as short-run fluctuations among most urban social indicators can be constructed, deduced, and analyzed for all metropolitan areas. The model employed in this study is taken from the one developed by the author termed the quality of life production model, see Liu [7,8,9,10,12]. Given that the quality of life indicators represented by a set of statistics on economic, political, environmental, health and education, and social conditions may offer clues to human attitudes and behavior and social performance over time, the quality of life that each individual (i) attempts to maximize may be expressed as an output function with two factor inputs as arguments--the physical (PH) and the psychological (PS)--a portion of which he owns and shares with other people in the community at any given point of time (t):

$$QOL_{it} = f (PH_{it}, PS_{it})$$

The physical input consists of quantifiable goods, services, material wealth, etc., while the psychological input includes all subjective spiritual, sociological, and anthropological factors such as community belongingness, esteem, self-actualization, love, affection, etc. Although the production function expressing the relationship between output and input factors of quality of life is known to be enormously complex (there are as many such factors as there are people), an aggregate homogeneous production function may be assumed for the community as a whole. Since what I call psychological inputs are not normally quantifiable at the present, the quality of life output may be taken at a particular point in time as a function of those social (SO), economic (EC), political and welfare (PW), health and education (HE), and environmental (EN) inputs which are quantifiable or:

$$QOL_{it} = F(EC_{it}, PW_{it}, EN_{it}, HE_{it}, SO_{it}, PS_{it})$$

The model proposed here is similar to the conventional production models employed to study the behavior of the firms. The two axes, instead of being labeled as capital and labor per unit of time, are respectively the ordinal measures of the psychological inputs and the cardinal measures of the physical inputs. The iso-quant curves are hereby replaced by the iso-quality of life curves, and the budget lines are substituted for by the individual's capability curves which, in this case, would likely be concave to the origin. The optimal level of quality of life is produced only by combining both the physical and psychological inputs in such a form as to locate the tangency point between the iso-quality and the capability constraint curves. Therefore, the quality of life that each individual perceives is assumed to be directly dependent on his capability constraints to exchange and to acquire, while the major concern for a society is how to improve an individual's capability by shifting the constraint curve outward to the right.

To measure objectively the output level of quality of life as subjectively perceived by the individuals, we may start with the cardinal measures of the physical inputs by holding constant the psychological inputs. More than 50 factors affecting the quality of life were selected to represent the social quality of life components.

Among the individual concerns in the social component, the quality of life is identified with the Individual Development (ID), Individual Equality (IE), and Community Living Conditions (CLC), i.e.,

$$SO_{it} = f(ID_{it}, IE_{it}, CLC_{it})$$

The major determinants of the individual development are the opportunity for self-support, the promoting of maximum development of individual capability, and a widening opportunity for individual choice. The concern with self-support implies independence and self-reliance. The existing opportunity for self-support thus may be represented by the labor force participation rate, the percent of labor force employed, the mean level of income which reflects employment and income earning opportunity, the family status of the dependent children, and the independence of married couples. Education, described previously, provides essential skills needed to acquire employment, and also more often than not, education generates employment opportunities. Therefore, it is also included to identify the existing opportunity for self-support. For the development of individual capabilities in this country, no investment other than education can be formal, efficient, effective, and rewarding. For persons with less than 15 years of education, some vocational training apparently enhances their capabilities professionally. Physically, health is fundamental to any development of individual capability. Thus, the individual health index also becomes one of the essential determinants in this group.

Individuals are expected to be very much concerned with available choices and appreciative of chances to acquire better knowledge and information about selection among jobs, residences, friends, etc. In order to widen the opportunity for individual choices, individuals have to be mobilized with better transportation, and information has to be broadly distributed and timely expedited. To assure mobility and efficient communication, variables such as automobile registration, newspaper circulation, and television and radio stations are used as positive indicators. The mobility and spatial choices are limited for young and senior citizens in the central city, and these limitations are probably the more serious the higher the population density. In addition, individual equality seems to be one of the preconditions for widening individual choices which, in turn, are obviously affected by the individual and institutional environment delineated previously.

Individuals are born equal and are concerned about racial, sex, and other discriminations. Regardless of race, sex, religion, and location, people in this country are protected by the law to enjoy equally the educational and employment opportunities that exist. Discrimination, however, is still present in this country due to reasons other than education. To reveal the rate at which racial and sex discrimination are being gradually eliminated within the metropolitan areas, the income and employment differentials between nonwhite and total persons, between nonwhite males and total males, between nonwhite females and

total females, and between males and females are all adjusted by the level of education and presented under the individual equality criterion. The implication of these variables is that the higher the equality, and the less the discrimination not resulting from educational differences, the better the social quality of life.

Three spatial variables are considered as negative attributes to the equality consideration. A high percentage of people working outside the county of residence generally indicates that the surrounding counties benefit substantially from incomes earned in the central city, while the central city, after providing job opportunities and public services, is significantly suffering from property tax revenue losses. Moreover, the commuters are normally in high paying jobs in the central city of an SMSA. As a result, the income inequality problem between those in the central city and others in the rest of an SMSA tends to be aggravated over periods of time. The third concern is the housing segregation problem. A housing segregation index which measures the percentage of Negroes living in the central city, as compared to the SMSA as a whole, is constructed.

The last of the critical social concerns in this study is community living conditions. These conditions circumscribe our daily life, and everyone's quality of life is vitally affected by them. Among the conditions three major areas are studied and variables pertaining to these three are selected. They are general living conditions, facilities, and other social conditions.

Within the general living conditions category, factors of great concern are community poverty, decent housing and living space, adequate utility services, uses of public transportation, crime rate, and the cost of living. While most of the data for the preceding variables are available in the Census of Population, a special endeavor was made to construct the cost of living index.

Under the facilities category, indicators representing public recreational facilities, financial institutions, service and trade establishments, hospitals and libraries are employed. Data on recreation were surveyed by the United States Bureau of Outdoor Recreation and are incomplete as might be expected. Only public facilities are included, which may exclude a large number of private facilities in some SMSA's.

All the facility variables are positive inputs of our urban life; their availability and the assessability to those public facilities and commercial establishments are primary social concerns to every metropolitan resident.

In addition to the general living conditions in the community that persons in the community jointly participate in and collectively enjoy, there are special cultural, sports, and other social activities. While it is generally agreed

that the more sports and cultural activities, the higher the community health, education, and natural environment indexes, and the lower the death rate, the better the quality of social life, the negative contribution of birth rate may warrant some explanation. It is hypothesized in this study that the majority of the population in this country is in favor of family control, and that the zero rate of population growth is also a social goal.

Thus, the social component, due to its broad nature and varying perceived concerns with our social well-being, is comprised of 54 factors. They are assumed to reflect critical social issues such as individual equality, individual concerns and community living conditions. While some variables are represented by published official sources, some are denoted by the firsthand 1970 data collected and computed by the author.

The data for 1970 were collected for the 65 largest SMSA's with populations greater than 500,000, and the standardized "Z" values were computed for all factors. On the basis of the percentile distribution of the "Z" values, SMSA's were divided into five groups and assigned points of 5, 4, 3, 2, or 1, respectively, for outstanding, (A); excellent (B); good (C); adequate (D); and substandard (E). Factors within the same subcategory were then weighed equally to derive a subcategory score, and the subcategory scores were weighed equally to obtain a subcomponent score. Finally the average of the subcomponent scores was taken to show the component index for each SMSA, which was subsequently rated by the indexes in comparison with other SMSA's.

III. The Results and Implications

Table 1 presents all statistical results. The most important findings in this study and their implications are broadly delineated in the following:

1. Portland ranks outstandingly as the finest metropolitan area with an index value of 1.03--1.86 standard deviations above the mean. Next are Seattle/Everett, Omaha, Denver, and Sacramento, all having very high index values. In addition, there are seven more outstanding SMSA's with index values higher than the mean (0.48) plus one standard deviation (0.29)--San Diego, Oklahoma City, Milwaukee, Minneapolis/St. Paul, Los Angeles/Long Beach, San Francisco/Oakland, and Kansas City. There are 13 SMSA's with substandard ratings; they all are located east of the Mississippi River and are clustered mainly in the Middle Atlantic and the East North Central regions. Jersey City and Detroit fall at the bottom of the list with index values substantially below the metropolitan average. In fact, they are the only two SMSA's with negative indexes.

The weakest factors in Jersey City are individual concerns. People in the city have very limited opportunities for development of individual

capabilities. Individual choice is restricted by immobility, lack of information, and spatial extension. For instance, only 36.3 percent of the population older than 25 have completed 4 years of high school or more--some 16.0 percentage points below the U.S. level. While 82.5 percent of the households in the U.S. have one or more automobiles, the corresponding figure for Jersey City is only 59.1 percent. Population density in the city is extremely high, with 12,963 persons per square mile--about 35 times the U.S. average of 360 persons. The extremely low positive indexes in the factors of individual concerns and community living conditions are more than offset by the negative indexes in the category of individual equality. As a result, the overall index value for the city in the social component becomes negative.

Detroit ranks low on all three counts in the social component--individual concerns, individual equality, and community living conditions. Nevertheless, Detroit received better than average ratings in several social factors. For instance, it ranks 29th in promoting maximum development of individual capabilities, 21st in racial equality, and 35th in other social living conditions. The low positive index values in individual concerns and community living conditions, however, are not enough to make up for the high negative index values in the individual equality category. For example, the SMSA had very high spatial inequalities as shown by housing segregation and income inequality indexes between city and suburban residents. The additive model employed in the study, hence, derived a negative social component index for the SMSA (-0.02). This suggests that more local emphasis might be placed on policies aimed at reducing individual inequalities between races, sexes, central city, and suburban populations.

Portland, Seattle/Everett, Omaha, Denver, and the other "A" rated SMSA's rated better than the U.S. average in almost all social factors. However, there are differences among them in terms of their strengths and weaknesses. Portland and Seattle/Everett are very close in the social component with indexes of 1.03 and 1.01. However, the living cost in the former is much lower than in the latter SMSA. People in Portland have a lower birth rate and enjoy more recreational facilities on a per capita basis than in Seattle/Everett but have a high unemployment rate and lower family income relative to Seattle/Everett.

2. Although it is normally expected that the levels of objectively measured quality of life vary from region to region and from component to component, it is very interesting to note that none of the 65 SMSA's have either all A's or all E's; i.e., showing exactly the same ratings for each of the three social quality of life components. In other words, this finding implies that in this country there is neither a perfect

region offering the best of social quality of life nor a worst region suffering substandard quality of life in all three major considerations. Two important implications are deduced from this observation. First, for policy decision-makers, it indicates that there is always an area (or areas) requiring special attention and extra effort in order to balance the overall social quality of life. Secondly, it points out the difficulty of constructing a single index to reflect the social quality of life or the social well-being for a specific region at a specific point in time.

3. The geographic distribution of ratings shows that the SMSA's of the Northeast account for most of the lower ratings and the SMSA's of the West Coast and Midwest dominate the outstanding ranks. Although the New England and Middle Atlantic regions showed unfavorably in the social component (no "A" rated SMSA), these regions had about one-half of the "B" or excellent SMSA's. However, almost all large SMSA's west of the Mississippi River are rated either excellent or outstanding except those in the State of Texas. The rankings in this study are highly consistent with those of state studies by Louis, Wilson, Smith, and others, see Liu [12]. Although there is no single indicator for the social component computed in the metropolitan studies by Coughlin and Smith, they demonstrate nearly identical patterns of geographic distribution of social well-being. For policy decisions, these patterns of concentration warrant special attention and strategies to cope with the findings.

4. As shown in Table 1, the overall standardized scores for the larger SMSA's range from -0.17 to 1.03. The widespread distribution among the social indexes can be discerned from its coefficient of variation which is equal to 0.61 (0.29/0.48). This coefficient of variation is much greater than those obtained for the economic and other QOL components obtained by the author [12], implying that social QOL varies appreciatively more than other QOL components. The substandard regions must go a long way socially to catch up with the outstanding SMSA's. This high variation in social quality, compounded with the pattern of geographic concentration, suggests that there are serious problems of social development in certain sections of this country. Investments in human capital which bring about greater mobility and equality, better opportunities and health, and higher technological learning capability among individuals are probably better means to achieve the national objective of equalizing the social differentials both geographically and among individuals.

IV. Concluding Remarks and Recommendations

This study represents a step forward in the social indicator arena because it theoretically developed a conceptual model for coping with the arguments in social quality of life determination,

and empirically employed the model to systematically evaluate the varying social elements of individual equality and individual concerns plus the level of community living conditions in the U.S. urban areas.

It is our hope that by describing the apparent weaknesses and strengths among the metropolitan areas, the findings will stimulate and aid decision-makers at all levels in their efforts to improve the overall quality of life for all people in this country.

There is certainly no guarantee at the present early stage in this type of social indicator research that decision-makers, public or private, will pay much attention to this kind of information. As Professor Campbell [3, p. 8] commented about our earlier state study. "The kinds of data considered in this monograph do not tell us directly how society's problems are to be solved, but they may serve a useful purpose in showing where the problems exist.

Other limitations of this study hinge upon the model development and methodology. Undoubtedly, the model can be further refined and the quality of life components can be modified and quantified in finer detail.

Since there are definite regional concentration patterns and inequalities in the social quality of life, a more thorough investigation of input factors in the average or substandard regions should reveal the cause-effect relationship, and the potential trade-offs between goals, such as individual development versus individual equality or community living conditions. Consequently, better policy alternatives and feasible remedies may be recommended.

TABLE 1
SOCIAL QUALITY OF LIFE INDICES AND RATINGS
FOR LARGE SMSA'S, 1970

SMSA	Overall Social	Individual Development (ID)	Individual Equality (IE)	Community Living Conditions (CLC)
Akron, Ohio	.1835 E	2.0981 C	-2.8611 E	1.3135 D
Albany-Schenectady-Troy, N.Y.	.5836 B	2.2509 B	-2.0278 C	1.5278 C
Allentown-Bethlehem-Easton, Pa.-N.J.	.2173 D	1.7954 D	-2.4111 E	1.4676 C
Anaheim-Santa Ana-Garden Grove, Ca.	.4762 C	3.0352 A	-2.4056 E	1.1991 D
Atlanta, Ga.	.2806 D	2.0787 C	-2.4444 D	1.2077 D
Baltimore, Md.	.1392 E	1.1426 E	-2.3611 D	1.6362 B
Birmingham, Ala.	.0931 E	.8296 E	-1.3889 A	.8386 E
Boston, Mass.	.6036 B	2.0574 C	-2.3889 D	2.1422 A
Buffalo, N.Y.	.7019 B	1.9537 C	-2.0278 C	2.1799 A
Chicago, Ill.	.3056 D	1.5370 D	-2.3611 D	1.7407 B
Cincinnati, Ohio-Ky.-Ind.	.0711 E	1.6676 D	-2.7778 E	1.3234 C
Cleveland, Ohio	.5837 B	1.9185 C	-2.1389 D	1.9716 B
Columbus, Ohio	.7621 B	2.3167 B	-1.0833 A	1.0529 D
Dallas, Texas	.4585 C	2.2815 B	-2.1111 C	1.2050 D
Dayton, Ohio	.3421 D	2.1778 B	-2.5000 D	1.3485 C
Denver, Colo.	.9604 A	2.7370 A	-2.1111 C	2.2553 A
Detroit, Mich.	-.0268 E	1.5315 D	-2.5278 E	.9220 E
Fort Lauderdale-Hollywood, Fla.	.5823 B	1.9426 C	-1.2778 A	1.0820 D
Fort Worth, Texas	.4437 C	2.2250 B	-2.3333 D	1.4200 C
Gary-Hammond-East Chicago, Ind.	.2106 D	1.5333 D	-1.8333 C	.9319 E
Grand Rapids, Mich.	.5527 C	2.3796 B	-2.1389 D	1.4173 C
Greenboro-Winston-Salem-High Point, N.C.	.2337 D	1.3704 E	-1.6944 B	1.0251 E
Hartford, Conn.	.5981 B	2.5694 A	-2.5000 D	1.7249 B
Honolulu, Hawaii	.4496 C	2.1426 C	-1.6944 B	.9008 E
Houston, Texas	.5573 C	2.1870 B	-2.0278 C	1.5126 C
Indianapolis, Ind.	.4303 C	1.7889 D	-1.9167 C	1.4187 C
Jacksonville, Fla.	.3169 D	1.5222 D	-1.3333 A	.7619 E
Jersey City, N.J.	-.1694 E	.6843 E	-2.0278 C	.8353 E
Kansas City, Mo.-Ks.	.8089 A	2.3500 B	-1.8333 C	1.9101 A
Los Angeles-Long Beach, Ca.	.8315 A	2.3787 B	-1.3611 A	1.4769 C
Louisville, Ky.-Ind.	.2603 D	1.3630 E	-1.8056 B	1.2235 D
Memphis, Tenn.-Ark.	.1198 E	1.1102 E	-1.3889 A	.6382 E
Miami, Fla.	.7634 B	1.8398 C	-1.0278 A	1.4782 C
Milwaukee, Wis.	.8453 A	2.5028 B	-2.1667 D	2.1997 A
Minneapolis-St. Paul, Minn.	.8329 A	2.9398 A	-2.1111 C	1.6700 B
Nashville-Davidson, Tenn.	.7218 B	1.5444 D	-.7500 A	1.3710 C
New Orleans, La.	.1783 E	1.0454 E	-1.5378 B	1.0172 E
New York, N.Y.	.5179 C	1.4500 D	-1.4167 A	1.5205 C
Newark, N.J.	.1000 E	1.5667 D	-1.0833 E	1.8168 B
Norfolk-Portsmouth, Va.	.2507 D	1.4176 D	-1.4444 A	.7791 E
Oklahoma City, Okla.	.8852 A	2.5796 A	-1.8889 C	1.9649 A
Omaha, Nebraska-Iowa	.9966 A	2.7139 A	-1.7500 B	2.0258 B
Paterson-Citicon-Passaic, N.J.	.1371 E	2.0713 C	-3.3056 E	1.6425 B
Philadelphia, Pa.-N.J.	.2234 D	1.2556 E	-2.2500 D	1.6667 B
Phoenix, Ariz.	.7246 B	2.5139 B	-1.5000 B	1.1601 D
Pittsburgh, Pa.	.3510 D	1.2713 E	-2.2222 D	2.0040 A
Portland, Oreg.-Wash.	1.0273 A	2.7870 A	-1.6111 B	1.9061 A
Providence-Pawtucket-Warwick, R.I.-Mass.	.1606 E	1.2833 E	-1.8333 C	1.0317 E
Richmond, Va.	.1123 E	1.3806 D	-2.0000 C	.9563 E
Rochester, N.Y.	.2196 D	2.4213 B	-3.1389 E	1.3763 C
Sacramento, Ca.	.9576 A	2.7843 A	-1.4444 B	1.7831 B
St. Louis, Mo.-Ill.	.1583 E	1.4519 D	-2.3889 D	1.4120 C
Salt Lake City, Utah	.5728 B	2.7509 A	-2.4444 D	1.4120 C
San Antonio, Texas	.2463 D	1.2361 E	-1.3333 A	.8360 E
San Bernardino-Riverside-Ontario, Ca.	.6042 B	2.1750 B	-1.5000 D	1.1376 D
San Diego, Ca.	.9020 A	2.4389 B	-1.5000 A	1.7672 B
San Francisco-Oakland, Ca.	.8189 A	2.4574 B	-1.7222 B	1.7216 B
San Jose, Ca.	.7364 B	2.8991 A	-2.0556 B	1.3657 C
Seattle-Everett, Wa.	1.0144 A	3.0352 A	-1.6389 B	1.6468 B
Springfield-Chicopee-Holyoke, Mass.-Conn.	.4634 C	1.8907 C	-2.2222 C	1.7216 B
Syracuse, N.Y.	.6157 B	2.3241 B	-1.9722 C	1.4954 A
Tampa-St. Petersburg, Fla.	.5526 C	1.5296 D	-1.1389 A	1.2672 D
Toledo, Ohio-Mich.	.5617 C	2.0278 C	-1.8333 C	1.4907 C
Washington, D.C.-Md.-Va.	.6848 B	2.8389 A	-2.1667 D	1.3823 C
Youngstown-Warren, Ohio	.3634 D	1.7278 D	-2.0833 C	1.4458 C
Mean (M) =	.4809	1.9863	-1.9756	1.4321
Standard Deviation (s) =	.2928	.5830	.5275	.3921

A = Outstanding ($\bar{x} + s$)
B = Excellent ($\bar{x} + .28s < x < \bar{x} + s$)
C = Good ($\bar{x} - .28s < x < \bar{x} + .28s$)
D = Adequate ($\bar{x} - s < x < \bar{x} - .28s$)
E = Substandard ($x < \bar{x} - s$)

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