

# UC Irvine

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### Title

A Scale for Markets and Property in the Societies of the Standard Cross-Cultural Sample: a Linear Programming Approach.

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### Author

Eff, E. Anthon

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## I. Introduction

Cross-cultural researchers often produce “scales” in which the values of several variables are combined into a composite index. In the Standard Cross-Cultural Sample (SCCS), a scale is most often simply the sum of the component variables as, for example, the cultural complexity scale formed by summing variables 149 through 158 (Murdock and Provost 1971); the pathogen stress scale (variable 1260) formed by adding variables 1253 through 1259 (Low 1988); and the modernization scale (variable 1849) created by summing variables 1806 through 1838 (Divale and Seda 2000). Other scales are produced using factor analysis, such as the factors produced on the gossip-related variables 1781-1805 (Divale and Seda 1999).

Scales created by summing component variables, by principal components analysis, or by factor analysis are all examples of composite indices, in which the values of component variables are combined into a single ordinal scale. A composite index, in its most general form, is the weighted sum of the component variables:

$$\theta_i = \sum_{r=1}^p y_{ri} \mu_r, \quad \forall i \quad (1)$$

where the value of the index for society  $i$  ( $\theta_i$ ) is the sum of the component variable values ( $y_{ri}$ ) for  $p$  components, each component value weighted by a weight ( $\mu_r$ ). The component variables are almost always first scaled similarly, typically by standardizing or converting to ranks. A wide variety of methods exist for specifying the weights  $\mu_r$ , and in most cases, there is no *a priori* reason to choose one weighting scheme over another. The choice of weights can therefore often be criticized as arbitrary.

<Figure 1 about here>

Figure 1a presents a scatter plot of two component variables for 20 societies. Note that society  $A$  has a low value for component 1 but a very high value for component 2. Society  $T$  is in the opposite situation: a very high value for component 1 but a low value for component 2.  $A$  would rank highest with high weights on component 2, and  $T$  would rank highest with high weights on component 1. Both of these

societies would rank relatively low when using equal weights on each component, a scheme which would cause societies  $O$  and  $Q$  to rank quite high. One can see, then, that changes in weights can lead to large changes in the overall index.

## II. Proposed method

Ideally, one would wish for a method that diminishes the effect of weight choice in ranking societies. The method we describe here does just that: it separates societies into groups, such that the between-group differences in index rank are based solely on data values ( $y_r$ ), not on weights ( $\mu_r$ ). The method employs linear programming, solving for weights on the individual components ( $\mu_r$ ) in order to calculate the highest possible index for the  $k^{\text{th}}$  society:

$$\text{Maximize} \quad \theta_k = \sum_{r=1}^p y_{rk} \mu_r \quad (2.a)$$

$$\text{Subject to} \quad \sum_{r=1}^p y_{ri} \mu_r \leq 1, \forall i \quad (2.b)$$

$$\mu_r \geq 0, \forall r \quad (2.c)$$

The constrained maximization problem in equations (2.a)-(2.c) is solved  $n$  times—once for each of the  $n$  societies. The objective function (2.a) selects weights in order to maximize the index score of the  $k^{\text{th}}$  society. Constraint (2.b), however, restricts the weights so that—applied to every one of the  $n$  societies—no society has a score higher than one. Thus, the highest value that the objective function may take is one—in such a case, the society will lie on the frontier shown in Figure 1a. In all other cases, the value of the objective function will be less than one, since the weights that maximize its own score give another society a score of one. Society  $S$ 's index score, for example, would equal the solid portion of the ray on which it lies, divided by the total length of the ray below the frontier.

The difference between the frontier and the below-frontier societies is not caused by weights, since there exists no set of weights which can make the below-frontier societies the peers of the frontier societies.

Thus, finding a frontier to which each society belongs (as in Figure 1b) would be a way of grouping societies into subsets *within which* differences in index values can be removed by weight adjustment, and *between which* differences in index values cannot be removed by adjusting weights. This property is attractive, since it allows us to construct an index, consisting of the order of a society's frontier (as in Figure 1b), whose values are not determined by an arbitrary choice of weights.

In practice, one would usually choose to replace the zero in constraint (2.c) with a very small positive number, so that *all* component variables are considered when computing the optimum. The larger the constraint level, the greater the number of frontiers that will be generated. One might also add a constraint so that the *shares* of all component variables in the optimum exceed a certain threshold (Pedraja, et al 1997).

This method of creating composite indices is closely related to the operations research procedure called *Tiered Data Envelopment Analysis* (TDEA) (Barr, et al 2000), based on the widely used efficiency analysis technique Data Envelopment Analysis (Charnes, et al 1978). Whereas TDEA is used to maximize an efficiency *ratio* of outputs over inputs, the present method in effect maximizes only the *numerator* of the efficiency ratio (the outputs). This numerator-only method has previously been used for ranking entities such as elementary schools (Eff 2004), universities (Bougnol and Dulá 2006), and U.S. states (Eff and Eff 2007).

### **III. A scale for markets and property**

As an example of this method, a scale is created for the prevalence of markets and property rights for the 186 societies in the SCCS. Descriptive statistics for the seven component variables selected are given in Table 1; the Pearson correlation coefficients in Table 2; and the SCCS codebook entries for each of these in Appendix 1.

<Table 1 and Table 2 about here>

The large number of missing values in the SCCS makes it prudent to use multiple imputation (Dow and Eff 2009a, 2009b). Accordingly 10 imputed data sets are created, each data set containing the seven component variables, with missing values replaced by imputed values. A scale is computed separately for each of the 10 imputed data sets.

The seven component variables are selected from a larger number which plausibly provide some measure of the prevalence of markets and property rights. Unlike scales based on shared variation, candidate variables for the TDEA scale need not be strongly correlated with each other—the suitability of a candidate variable is determined *conceptually* (“does this variable measure some dimension of what this scale tries to capture?”) rather than *empirically* (“does this variable correlate strongly with the other variables?”). Thus, for example, TDEA rankings of secondary schools might include component variables that are nearly orthogonal with each other, such as academic scores and the performance of sports teams. Despite the lack of shared variation, these nearly orthogonal variables measure valid dimensions of what one would consider a high school’s performance, and so are conceptually sound choices for component variables.

Nevertheless, most scales used in cross-cultural research would in fact contain component variables that *correlate consistently* with each other—that is, the correlations of a component with other components would all be of the same sign and usually significant. From Table 2, one can see that the seven selected variables all have consistently signed correlations, though the Cronbach’s alpha (0.653) would be considered a little low for scales based on shared variation, such as principal components or factor analysis. In fact, one can imagine that factor analysis might produce two latent variables from these seven component variables: one for markets, another for property. A virtue of the TDEA approach is that separate, but related, dimensions can be combined into a composite index.

#### *A GAMS program*

The variable v1726 correlates negatively with the remaining six. It is therefore multiplied by negative one, to ensure that it varies directly with the others. All seven component variables are then standardized,

with a mean of 100 and a standard deviation of 15, so that no values are negative. The standardizations are performed separately within each of 10 imputed data sets.

A variety of software packages will perform linear programming; the program used here was executed in GAMS.<sup>1</sup> Appendix 2 contains the entire program. The input data are contained in a file called “tkap.dat”, which is formatted as follows:

```

/
1 .1 .V17 = 84.2500
1 .1 .V1726= 87.2813
1 .1 .V1732= 111.6094
1 .1 .V1733= 83.3281
1 .1 .V1734= 108.6406
1 .1 .V278 = 80.9531
1 .1 .V279 = 106.9375
1 .2 .V17 = 84.2500
1 .2 .V1726= 87.2813
.
.
.
10.185.V278 = 81.7969
10.185.V279 = 69.9688
10.186.V17 = 84.5469
10.186.V1726= 88.6406
10.186.V1732= 80.7344
10.186.V1733= 102.7031
10.186.V1734= 95.5156
10.186.V278 = 81.7969
10.186.V279 = 69.9688
/;

```

Each row in the input file takes the form  $t.j.k = x$ , where  $t$  is the imputation number (1,...,10),  $j$  is the society number (1,...,186),  $k$  is the component variable name, and  $x$  is the value of the  $k^{\text{th}}$  variable, for the  $j^{\text{th}}$  society, in the  $t^{\text{th}}$  imputed data set. The input file “tkap.dat” contains 13,022 lines—the initial “/” and terminal “/;” symbols, and  $10*186*7=13,020$  lines containing data values.

The program executes a series of nested loops, finding the optimal weights for each society, one imputed data set at a time. Within each imputed data set, any society reaching the frontier is removed from the set of comparison societies, using the parameter  $d(j)$ . Two output data sets are produced: *capi.ud0* records the weights used; *capi.ud1* records the iteration at which a society reaches the frontier. The iteration number must later be converted to the desired scale:  $scale = \max(\text{iteration}) - \text{iteration} + 1$ .

---

<sup>1</sup> For the open source options, a good starting place is <http://cran.r-project.org/web/views/Optimization.html>. GAMS is described in Wikipedia: [http://en.wikipedia.org/wiki/General\\_Algebraic\\_Modeling\\_System](http://en.wikipedia.org/wiki/General_Algebraic_Modeling_System)

The GAMS program sets the minimum weight size in constraint (2.c) to one-millionth, using the command  $mu.lo(k)=.000001$ . Were one to set this level to an even smaller number, fewer discrete values would appear in the final scale.

Appendix 3 shows the values for the scale for each of the 10 imputations, sorted in ascending order for the society mean. The table is presented simply to show that the resulting scale seems reasonable, given the societies that rank low and high. The mean scale should not be used in a regression analysis, since it contains imputed values; a regression analysis should be conducted on each of the imputed data sets, and the results combined, as shown in Dow and Eff (2009a, 2009b).

When the component variables are highly correlated with each other, the TDEA scale will be quite similar to the first principal component of the variables. Since the first principal component in such cases will have nearly equal weights on each of the variables, the mean or sum of the variables would also correlate quite highly with the first principal component (since these are also equal-weight indices). For our market and property index, with moderate correlation among the seven variables, the first principal component and the mean are practically identical, with a correlation of 0.992. The correlation between the TDEA scale and these two measures is about 0.793—quite high, but still different. This shows that allowing weights to vary, so as to group societies for which weight adjustments suffice to produce identical outcomes, leads to non-trivial differences in the ordinal ranking of societies.

#### **IV. Summary**

The scales often used by cross-cultural researchers are weighted sums of component variables. Different choices of weights will produce different rank orderings of societies. The method presented here reduces the sensitivity of the scale to the weights chosen, by classifying together societies for whom adjustments in weights give an equally high rank.

The method is particularly suitable for cases where weakly correlated or orthogonal variables are combined into a scale. For example, variables for internal war and external war (Ember and Ember 1992) could be combined into a scale for the prevalence of war.

The GAMS program given in Appendix 2 creates a scale for the prevalence of markets and property rights in the 186 societies of the SCCS, using the seven component variables shown in Appendix 1. Since multiple imputation offers the best approach for using the SCCS (Dow and Eff 2009a, 2009b), the program creates the scale for each of 10 imputed data sets. With suitable modifications, the program can be used to produce any scale for SCCS data.



## References

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<http://econpapers.repec.org/paper/mtswpaper/200403.htm> .
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**Table 1: Descriptive statistics for component variables**

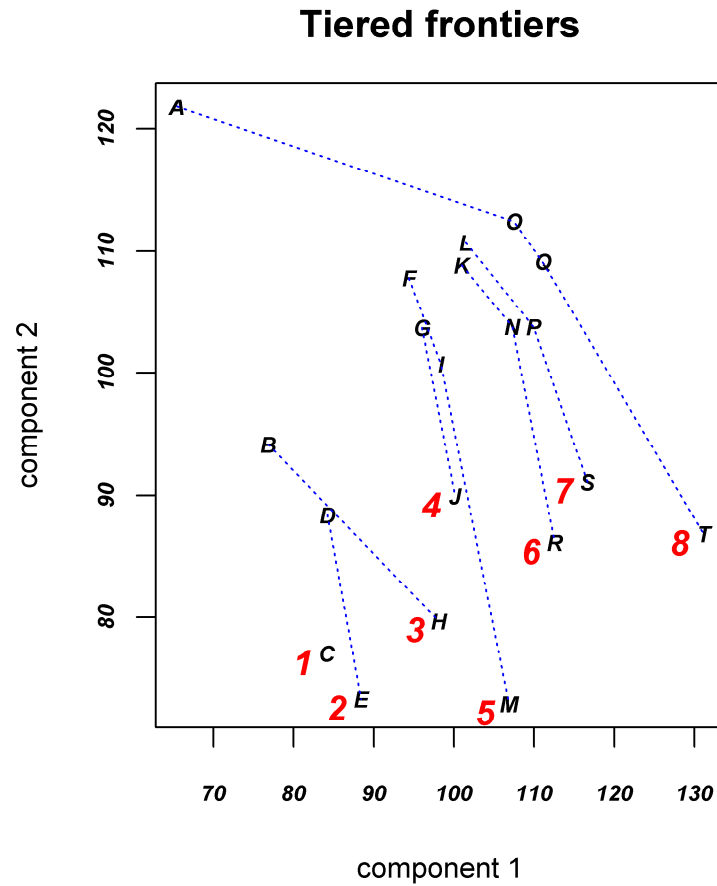
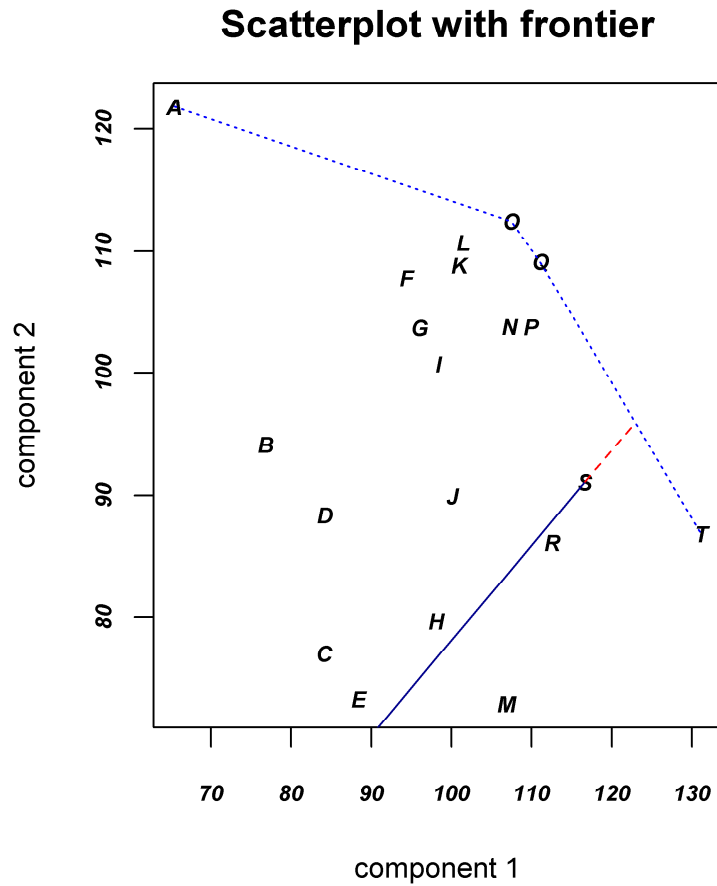
Variable	Label	N	Max	Mean	Min	invert	Alpha
v17	Money Media Of Exchange And Credit	183	5	2.617	1	0	0.570
v1726	Communality Of Land	98	1	2.240	3	1	0.624
v1732	Presence Of Wage Labor	89	2	1.603	1	0	0.637
v1733	Market Exchange Within Local Community	96	4	2.792	1	0	0.648
v1734	Market Exchange Outside Of Local Community	99	4	3.426	1	0	0.640
v278	Inheritance Of Real Property (Land)	155	2	1.596	1	0	0.595
v279	Inheritance Of Movable Property	152	2	1.821	1	0	0.601
TDEAscale	Scale produced from GAMS program	186	12	7.11	1		

Notes: All variables are from the SCCS. Cronbach's alpha=0.653. "Alpha" is the Cronbach's alpha when the row variable is *excluded*. "invert"=1 when the variable is negatively correlated with the meaning of the scale. The descriptive statistics and the alphas are all produced from multiply imputed data ( $m=10$ ).

**Table 2: Pearson correlation coefficients among component variables**

Variable	v17	v1726	v1732	v1733	v1734	v278	v279	mnAbs
v17	1.00	-0.35	0.25	0.21	0.21	0.42	0.29	0.39
v1726	-0.35	1.00	-0.17	-0.11	-0.14	-0.31	-0.13	0.31
v1732	0.25	-0.17	1.00	0.12	0.14	0.14	0.24	0.29
v1733	0.21	-0.11	0.12	1.00	0.22	0.11	0.17	0.28
v1734	0.21	-0.14	0.14	0.22	1.00	0.11	0.20	0.29
v278	0.42	-0.31	0.14	0.11	0.11	1.00	0.42	0.36
v279	0.29	-0.13	0.24	0.17	0.20	0.42	1.00	0.35

Notes: Variable labels given in Table 1. "mnAbs" is the mean of the absolute values of the row correlation coefficients.



**Figure 1:** The values of two component variables are plotted for twenty societies. Linear programming is used to wrap a convex frontier around the cloud of points; societies on the frontier are tied for the highest composite score, while societies below the frontier have a score given by their location as the proportion of the distance from the origin to the frontier. The tiered frontiers method draws a series of successive convex frontiers, classifying each society into a peer group, based on the values of the component variables. The order of the frontier is then used as an index.

## Appendix 1: Variable descriptions from the SCCS (Divale 2004)

17.	Money (media of exchange) and credit		
3	. = Missing Data		
77	1 = No media of exchange or money		
12	2 = Domestically usable articles as media of exchange		
26	3 = Tokens of conventional value as media of exchange		
42	4 = Foreign coinage or paper currency		
26	5 = Indigenous coinage or paper currency		
278.	Inheritance of real property (land)		
279.	Inheritance of movable property		
	* Note change in order from 278 280	278	279
		Land	Movables
	. = Missing data	31	34
	1 = Absence of individual property rights or rules	59	22
	2 = Matrilineal (sister's sons)	4	5
	3 = Other matrilineal heirs (e.g., younger brothers)	9	9
	4 = Children, with daughters receiving less	12	14
	5 = Children, equally for both sexes	9	22
	6 = Other patrilineal heirs (e.g., younger brothers)	8	9
	7 = Patrilineal (sons)	54	71
1726.	Communality of land		
88	. = missing data		
22	1 = land predominantly private property		
24	2 = land partially communally used		
52	3 = communal land use rights only		
1732.	Presence of wage labor		
97	. = missing data		
36	1 = no wage labor		
22	2 = wage labor present, migratory labor unimportant		
31	3 = wage labor, mainly in the form of migratory labor		
1733.	Market exchange within local community		
90	. = missing data		
23	1 = no market exchange (original code 10)		
10	2 = market exchange within local community present, no * further information (original code 20)		
27	3 = market exchange within local community present, involving * local and regional products (original code 21)		
36	4 = market exchange within local community present, involving * local, regional, and supra-regional products (original * code 22)		
1734.	Market exchange outside of local community		
87	. = missing data		
10	1 = no market exchange outside of local community * (original code 10)		
5	2 = market exchange outside of local community (at trading * posts, market places), no further information (original * code 20)		
26	3 = market exchange outside of local community, involving * local and regional products (original code 21)		
58	4 = market exchange outside of local community, involving * local, regional, and supra-regional products (original * code 22)		

## Appendix 2: GAMS program for producing LP scales

```
$offsymxref offsymlist;
$offlisting;
options solprint=off, limcol=0, limrow=0;

* DEA for scale construction from SCCS variables
* DMU=societies
* Sequential Frontier Model
* Primal Form with output weight constraints
* Effectiveness-No inputs considered

file ud0 /capi.ud0/;
ud0.ap=1;
file udl /capi.udl/;
udl.ap=1;

SETS

J societies /
  1 NamaHottentot
  2 KungBushmen
  3 Thonga
  4 Lozi
  5 Mbundu
  6 Suku
  7 Bemba
  8 Nyakyusa
  9 Hadza
 10 Luguru
 11 Kikuyu
 12 Ganda
 13 Mbuti
 14 NkundoMongo
 15 Banen
 16 Tiv
 17 Ibo
 18 Fon
 19 Ashanti
 20 Mende
 21 Wolof
 22 Bambara
 23 Tallensi
 24 Songhai
 25 PastoralFulani
 26 Hausa
 27 MassaMasa
 28 Azande
 29 FurDarfur
 30 OtoroNuba
 31 Shilluk
 32 Mao
 33 KaffaKafa
 34 Masai
 35 Konso
 36 Somali
 37 Amhara
 38 Bogo
 39 KenuziNubians
 40 Teda
 41 Tuareg
 42 Riffians
 43 Egyptians
 44 Hebrews
 45 Babylonians
 46 RwalaBedouin
 47 Turks
 48 GhegAlbanians
 49 Romans
 50 Basques
```

51 Irish  
52 Lapps  
53 YurakSamoyed  
54 Russians  
55 Abkhaz  
56 Armenians  
57 Kurd  
58 Basseri  
59 PunjabiWest  
60 Gond  
61 Toda  
62 Santal  
63 UttarPradesh  
64 Burusho  
65 Kazak  
66 KhalkaMongols  
67 Lolo  
68 Lepcha  
69 Garo  
70 Lakher  
71 Burmese  
72 Lamet  
73 Vietnamese  
74 Rhade  
75 Khmer  
76 Siamese  
77 Semang  
78 Nicobarese  
79 Andamanese  
80 Vedda  
81 Tanala  
82 NegriSembilan  
83 Javanese  
84 Balinese  
85 Iban  
86 Badjau  
87 Toradja  
88 Tobelorese  
89 Alorese  
90 Tiwi  
91 Aranda  
92 Orokaiva  
93 Kimam  
94 Kapauku  
95 Kwoma  
96 Manus  
97 NewIreland  
98 Trobrianders  
99 Siuai  
100 Tikopia  
101 Pentecost  
102 MbauFijians  
103 Ajie  
104 Maori  
105 Marquesans  
106 WesternSamoans  
107 Gilbertese  
108 Marshallese  
109 Trukese  
110 Yapese  
111 Palauans  
112 Ifugao  
113 Atayal  
114 Chinese  
115 Manchu  
116 Koreans  
117 Japanese  
118 Ainu  
119 Gilyak  
120 Yukaghir  
121 Chukchee

122 Ingalik  
 123 Aleut  
 124 CopperEskimo  
 125 Montagnais  
 126 Micmac  
 127 Saulteaux  
 128 Slave  
 129 Kaska  
 130 Eyak  
 131 Haida  
 132 Bellacoola  
 133 Twana  
 134 Yurok  
 135 PomoEastern  
 136 YokutsLake  
 137 PaiuteNorth.  
 138 Klamath  
 139 Kutenai  
 140 GrosVentre  
 141 Hidatsa  
 142 Pawnee  
 143 Omaha  
 144 Huron  
 145 Creek  
 146 Natchez  
 147 Comanche  
 148 Chiricahua  
 149 Zuni  
 150 Havasupai  
 151 Papago  
 152 Huichol  
 153 Aztec  
 154 Popoluca  
 155 Quiche  
 156 Miskito  
 157 Bribri  
 158 CunaTule  
 159 Goajiro  
 160 Haitians  
 161 Callinago  
 162 Warrau  
 163 Yanomamo  
 164 CaribBarama  
 165 Saramacca  
 166 Mundurucu  
 167 CubeoTucano  
 168 Cayapa  
 169 Jivaro  
 170 Amahuaca  
 171 Inca  
 172 Aymara  
 173 Siriono  
 174 Nambicuara  
 175 Trumai  
 176 Timbira  
 177 Tupinamba  
 178 Botocudo  
 179 Shavante  
 180 Aweikoma  
 181 Cayua  
 182 Lengua  
 183 Abipon  
 184 Mapuche  
 185 Tehuelche  
 186 Yahgan

/

KK outputs/  
 V17 Money Media Of Exchange And Cred  
 V1726 Commuality Of Land  
 V1732 Presence Of Wage Labor

```

V1733    Market Exchange Within Local Com
V1734    Market Exchange Outside Of Local
V278     Inheritance Of Real Property
V279     Inheritance Of Movable Prope /

tt  imputations /1*10/;

;
*  jp(j) /1*40/;

alias(jp,j);
alias(k,kk);
alias(t,tt);

parameter Y(tt,J,kk) components for DEA index
$include 'tkap.dat';

parameter d(J) weights for output;
parameter ww(J) duplicate weights for output;
parameter f(j,kk) components for particular imputation;

scalar    gv  generic value;
scalar    gv1 generic value;
scalar    gv2 generic value;
scalar    itr iteration;

VARIABLES
  EFFICIENCY  efficiency measure
  outdum(k)   output dummy

POSITIVE VARIABLES
  mu(k)       output weights

EQUATIONS
  OBJECTIVE   Efficiency level of DMU0
  Allheld(j)  Holding all efficiency ratios less than or equal one;

mu.lo(k)=.000001;
OBJECTIVE..  EFFICIENCY =E=sum(k,mu(k)*outdum(k));
Allheld(j).. sum(k,mu(k)*d(j)*f(j,k))=L=1;

MODEL  manuf /ALL/;

loop(t,

f(j,k)=y(t,j,k);
d(j) =1;
ww(j) =1;
itr =0;
gv1=sum(j,ww(j));

while (gv1>0,

itr=itr+1;
d(j)=ww(j);

loop(jp,
if(d(jp)=1,

loop(k,
outdum.fx(k)=d(jp)*y(t,jp,k);
);

SOLVE  manuf USING nLP MaxIMIZING efficiency;

gv=round(efficiency.L,5);
if (gv=1,ww(jp)=0)

put ud0;
if (itr=1,

```



```

loop(k,
put t.TL:<10;
put jp.TL:<10;
put itr:<10:0;
put mu.L(k):<10:5;
put y(t,jp,k):<10:5;
gv2=mu.L(k)*y(t,jp,k);
put gv2:<16:5;
put k.TL:<10;
put @80 k.te(k);
put / );
);

put ud1;
gv=round(efficiency.L,5);
if (gv=1,
put t.TL:<10;
put jp.TL:<10;
put itr:<10:0;
put efficiency.L:<10:5;
put gv1:<10:0;
put @70 j.te(jp) /);
);
);
gv1=sum(j,ww(j));
);
);

```

### Appendix 3: Markets and Property scale for the 10 imputed data sets

SCCSno	Society	imp1	imp2	imp3	imp4	imp5	imp6	imp7	imp8	imp9	imp10	mean
173	Siriono	2	1	1	1	1	1	1	1	1	2	1.2
180	Aweikoma	2	1	1	1	1	1	1	1	1	2	1.2
79	Andamanese	2	1	1	1	2	1	2	2	2	2	1.6
179	Shavante	4	1	2	1	1	3	4	1	2	2	2.1
183	Abipon	1	3	1	1	2	5	3	3	3	1	2.3
92	Orokaiva	5	2	2	2	2	2	2	2	3	3	2.5
2	KungBushmen	3	2	2	2	4	3	3	3	3	3	2.8
178	Botocudo	4	2	5	1	2	3	4	4	2	2	2.9
182	Lengua	2	1	1	2	1	4	3	7	4	4	2.9
186	Yahgan	5	3	3	2	2	3	3	3	3	3	3
163	Yanomamo	4	3	4	2	4	4	3	3	3	3	3.3
104	Maori	5	3	4	3	3	4	3	3	3	4	3.5
176	Timbira	4	2	2	5	2	3	4	5	4	4	3.5
13	Mbuti	4	3	4	2	4	4	5	4	4	4	3.8
25	PastoralFulani	4	3	4	2	4	4	5	4	4	4	3.8
98	Trobrianders	5	3	4	3	4	4	4	4	3	4	3.8
31	Shilluk	6	4	3	3	2	4	4	4	5	4	3.9
9	Hadza	4	5	6	2	2	3	5	5	4	4	4
181	Cayua	4	3	7	1	4	3	4	4	6	4	4
185	Tehuelche	5	1	4	5	2	6	5	5	6	2	4.1
91	Aranda	6	4	4	3	5	5	4	4	4	4	4.3
129	Kaska	6	4	4	3	5	5	4	4	4	4	4.3
138	Klamath	7	4	3	4	3	6	2	7	4	3	4.3
174	Nambicuara	6	4	2	3	4	6	3	3	5	7	4.3
70	Lakher	6	3	4	3	5	4	5	4	5	5	4.4
140	GrosVentre	5	5	5	2	3	5	5	7	4	3	4.4
162	Warrau	4	6	4	3	5	4	5	2	6	6	4.5
1	NamaHottentot	5	6	4	3	6	5	4	7	3	3	4.6
133	Twana	5	4	5	3	5	4	5	5	5	5	4.6
137	PaiuteNorth.	4	4	3	6	6	5	4	6	7	2	4.7
164	CaribBarama	9	5	3	4	2	5	3	3	5	8	4.7
4	Lozi	6	4	5	4	3	5	6	4	5	6	4.8
120	Yukaghir	6	4	4	6	4	4	4	9	4	3	4.8
161	Callinago	6	3	9	3	5	5	4	4	4	6	4.9
103	Ajie	6	5	5	4	5	5	5	5	5	5	5
166	Mundurucu	7	4	4	4	5	5	5	6	5	5	5
90	Tiwi	5	4	5	3	6	5	5	6	6	6	5.1
124	CopperEskimo	4	4	4	6	5	4	7	6	5	6	5.1
24	Songhai	7	4	5	6	4	6	6	5	3	6	5.2
175	Trumai	7	5	5	4	5	5	5	6	5	5	5.2
139	Kutenai	6	5	5	5	5	5	5	6	6	5	5.3
148	Chiricahua	6	3	7	6	4	7	8	7	3	2	5.3
34	Masai	8	4	5	4	4	5	7	6	6	6	5.5
165	Saramacca	7	5	5	4	6	5	6	5	6	6	5.5
170	Amahuaca	6	7	6	4	6	7	7	5	3	4	5.5
8	Nyakyusa	7	6	6	4	5	6	5	6	6	5	5.6
177	Tupinamba	8	5	7	3	4	4	5	8	4	8	5.6
29	FurDarfur	7	5	5	5	6	6	6	5	6	6	5.7
134	Yurok	7	5	5	5	7	6	6	6	5	5	5.7
128	Slave	7	5	6	4	5	6	6	9	5	5	5.8
141	Hidatsa	8	5	6	5	6	6	5	7	5	5	5.8
147	Comanche	7	7	6	3	5	6	7	7	5	5	5.8
121	Chukchee	5	5	8	5	5	6	6	7	6	6	5.9
30	OtoroNuba	7	5	6	4	5	9	5	7	6	6	6
41	Tuareg	9	5	6	6	5	7	5	6	6	6	6.1
72	Lamet	7	6	6	5	6	6	7	6	6	6	6.1
77	Semang	8	5	5	5	7	6	6	7	6	6	6.1
126	Micmac	5	7	7	3	5	8	6	9	5	6	6.1
157	Bribri	7	6	3	7	7	8	6	7	5	5	6.1
100	Tikopia	8	6	6	5	6	6	6	7	6	6	6.2

SCCSno	Society	imp1	imp2	imp3	imp4	imp5	imp6	imp7	imp8	imp9	imp10	mean
101	Pentecost	7	5	6	5	5	10	6	8	6	4	6.2
130	Eyak	6	5	7	4	7	5	7	7	7	7	6.2
27	MassaMasa	8	6	8	6	6	7	5	6	4	7	6.3
125	Montagnais	7	6	5	6	7	5	7	7	6	7	6.3
132	Bellacoola	7	6	6	6	6	6	6	7	7	6	6.3
150	Havasupai	7	6	7	4	6	6	6	8	7	6	6.3
60	Gond	6	6	6	6	6	7	7	7	6	7	6.4
143	Omaha	6	5	4	6	9	9	6	6	9	4	6.4
6	Suku	8	6	6	6	6	7	6	7	7	6	6.5
52	Lapps	7	6	9	7	5	7	5	7	5	7	6.5
168	Cayapa	6	7	6	7	6	4	7	11	5	6	6.5
12	Ganda	8	6	7	5	6	7	7	7	6	7	6.6
19	Ashanti	7	6	7	6	6	7	7	7	7	6	6.6
93	Kimam	8	7	4	4	7	7	6	11	5	7	6.6
102	MbauFijians	8	7	6	9	7	7	7	6	5	4	6.6
146	Natchez	8	6	6	6	7	7	11	5	3	7	6.6
96	Manus	9	5	7	5	7	6	8	8	5	7	6.7
123	Aleut	8	6	7	6	6	7	6	8	7	6	6.7
33	KaffaKafa	10	8	7	7	5	5	6	8	7	5	6.8
97	NewIreland	7	6	6	8	6	7	5	9	9	5	6.8
127	Saulteaux	7	8	5	5	8	7	6	7	8	7	6.8
171	Inca	9	7	8	4	7	9	6	8	5	5	6.8
16	Tiv	8	7	7	6	6	7	6	8	7	7	6.9
58	Basseri	8	7	6	6	7	7	7	8	7	6	6.9
135	PomoEastern	9	7	7	5	7	7	7	7	6	7	6.9
10	Luguru	8	6	6	9	9	8	4	9	4	7	7
81	Tanala	9	7	7	5	7	7	7	7	7	7	7
89	Alorese	7	7	5	6	6	7	10	8	8	6	7
136	YokutsLake	10	6	7	5	8	7	6	8	6	7	7
11	Kikuyu	9	7	7	6	7	7	7	8	7	7	7.2
22	Bambara	8	7	7	7	7	7	7	8	7	7	7.2
67	Lolo	7	9	6	9	6	7	8	6	7	7	7.2
69	Garo	9	7	7	6	7	7	7	8	7	7	7.2
86	Badjau	9	7	7	6	7	7	8	7	7	7	7.2
111	Palauans	8	7	6	6	7	7	8	7	9	7	7.2
131	Haida	10	5	7	8	8	6	5	8	9	6	7.2
142	Pawnee	9	7	7	6	7	7	8	7	7	7	7.2
167	CubeoTucano	9	7	7	6	7	7	8	7	7	7	7.2
169	Jivaro	9	7	7	6	7	7	8	7	7	7	7.2
80	Vedda	8	8	7	7	7	7	7	8	8	7	7.4
106	WesternSamoans	11	3	8	8	9	5	7	10	8	5	7.4
36	Somali	8	7	7	7	8	7	7	8	8	8	7.5
53	YurakSamoyed	9	7	10	6	6	8	8	9	7	6	7.6
118	Ainu	11	9	7	6	7	7	8	7	7	7	7.6
17	Ibo	11	6	7	8	9	6	6	9	7	8	7.7
109	Trukese	9	8	7	7	7	8	8	8	8	7	7.7
113	Atayal	9	11	9	8	5	5	7	9	7	7	7.7
159	Goajiro	8	7	8	8	7	6	8	9	8	8	7.7
7	Bemba	9	7	9	8	6	11	7	7	6	8	7.8
107	Gilbertese	10	8	8	7	8	6	8	8	9	6	7.8
112	Ifugao	10	7	8	7	7	8	6	9	11	5	7.8
144	Huron	9	7	9	6	8	7	8	9	8	7	7.8
99	Siuai	10	6	5	8	6	10	7	12	9	6	7.9
15	Banen	12	9	8	6	6	5	8	8	10	8	8
20	Mende	8	8	6	7	7	9	10	9	8	8	8
61	Toda	9	8	7	7	8	8	8	9	8	8	8
145	Creek	10	7	9	6	9	7	8	10	7	7	8
156	Miskito	8	9	7	6	9	9	6	8	11	7	8
184	Mapuche	9	8	8	7	8	8	7	9	8	8	8
32	Mao	9	8	7	8	8	8	10	7	8	8	8.1
37	Amhara	9	8	8	7	8	8	8	9	8	8	8.1
64	Burusho	10	7	9	10	7	11	8	8	5	6	8.1

SCCSno	Society	imp1	imp2	imp3	imp4	imp5	imp6	imp7	imp8	imp9	imp10	mean
65	Kazak	8	10	7	7	7	8	7	9	9	9	8.1
87	Toradja	12	8	10	5	11	7	7	6	10	5	8.1
40	Teda	7	8	8	8	10	8	9	8	8	8	8.2
152	Huichol	7	8	7	8	8	7	8	11	9	9	8.2
5	Mbundu	7	8	9	5	10	7	10	9	9	9	8.3
74	Rhade	8	6	8	9	11	9	8	9	7	8	8.3
122	Ingalik	10	8	8	7	8	8	8	10	8	8	8.3
35	Konso	9	7	9	6	8	8	7	11	10	9	8.4
95	Kwoma	9	9	7	8	9	9	7	9	8	9	8.4
105	Marquesans	10	8	9	8	8	5	11	11	8	7	8.5
153	Aztec	10	8	9	7	8	8	10	9	8	8	8.5
39	KenuziNubians	11	10	6	8	10	7	9	9	7	9	8.6
62	Santal	9	9	9	8	8	8	9	9	9	8	8.6
151	Papago	10	9	9	7	9	8	7	11	8	8	8.6
155	Quiche	8	7	9	9	8	11	8	9	9	8	8.6
23	Tallensi	10	8	9	8	7	8	9	10	9	9	8.7
18	Fon	10	10	8	9	10	8	8	8	8	10	8.9
46	RwalaBedouin	10	9	8	8	9	9	8	10	9	9	8.9
73	Vietnamese	10	7	8	8	9	9	9	9	10	10	8.9
115	Manchu	11	9	8	7	9	9	8	10	9	9	8.9
38	Bogo	7	10	8	8	9	10	9	10	10	9	9
57	Kurd	10	9	10	8	9	8	8	10	9	9	9
94	Kapauku	10	9	9	8	9	9	8	11	9	8	9
119	Gilyak	10	9	8	8	9	9	9	10	9	9	9
154	Popoluca	9	8	10	7	8	9	10	10	10	9	9
3	Thonga	10	9	9	8	9	9	9	10	9	9	9.1
26	Hausa	10	8	10	8	8	8	10	10	10	9	9.1
158	CunaTule	11	7	11	9	8	8	7	11	9	10	9.1
55	Abkhaz	11	6	11	10	8	11	10	11	7	7	9.2
149	Zuni	11	9	9	8	9	9	9	10	9	9	9.2
56	Armenians	12	10	10	8	10	9	8	10	9	7	9.3
66	KhalkaMongols	11	9	9	8	9	9	10	10	9	9	9.3
28	Azande	10	8	9	7	10	10	9	12	11	8	9.4
78	Nicobarese	11	9	9	8	9	9	10	11	9	9	9.4
85	Iban	10	9	10	8	9	10	10	11	10	9	9.6
14	NkundoMongo	11	8	9	9	8	11	10	10	10	11	9.7
42	Riffians	10	10	10	9	9	9	10	11	10	9	9.7
54	Russians	10	10	10	8	10	10	9	10	10	10	9.7
59	PunjabiWest	10	10	10	9	9	9	10	11	10	9	9.7
88	Tobelorese	9	10	10	9	9	11	9	9	11	10	9.7
110	Yapese	11	10	10	9	10	7	9	12	10	10	9.8
21	Wolof	11	9	10	9	10	10	10	11	10	9	9.9
76	Siamese	10	9	11	9	11	9	8	11	10	11	9.9
83	Javanese	12	9	11	9	11	9	8	11	10	9	9.9
48	GhegAlbanians	11	11	10	10	9	9	10	12	10	9	10.1
116	Koreans	11	10	10	9	10	10	10	11	10	10	10.1
84	Balinese	10	11	10	10	11	8	11	10	11	11	10.3
45	Babylonians	12	9	11	8	11	11	10	11	10	11	10.4
49	Romans	12	10	11	9	11	10	10	12	10	10	10.5
71	Burmese	10	10	11	10	10	10	11	11	11	11	10.5
82	NagriSembilan	9	11	11	10	11	10	10	11	11	11	10.5
108	Marshallese	11	10	11	8	11	11	10	12	10	11	10.5
172	Aymara	11	11	10	10	11	10	11	9	11	11	10.5
47	Turks	12	10	11	10	11	10	10	11	11	10	10.6
50	Basques	12	10	11	9	11	11	10	11	11	10	10.6
75	Khmer	11	10	11	10	10	10	11	12	11	10	10.6
114	Chinese	12	10	11	10	11	11	10	11	10	10	10.6
68	Lepcha	12	11	11	10	11	11	9	11	11	10	10.7
44	Hebrews	11	11	11	9	11	10	11	12	11	11	10.8
63	UttarPradesh	12	11	11	10	11	11	11	11	11	10	10.9
43	Egyptians	12	11	11	10	11	11	11	12	11	11	11.1
51	Irish	12	11	11	10	11	11	11	12	11	11	11.1

<b>SCCSno</b>	<b>Society</b>	<b>imp1</b>	<b>imp2</b>	<b>imp3</b>	<b>imp4</b>	<b>imp5</b>	<b>imp6</b>	<b>imp7</b>	<b>imp8</b>	<b>imp9</b>	<b>imp10</b>	<b>mean</b>
117	Japanese	12	11	11	10	11	11	11	12	11	11	11.1
160	Haitians	12	11	11	10	11	11	11	12	11	11	11.1