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# Deriving the relative importance of the various components of a household's standard of living: the case of Mexico

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## Abstract

This paper proposes three ways of deriving an asset index when the variables are all dichotomous. The basic idea is that households behave as if they were implicitly assigning an order of importance to the various assets that they may acquire. This order is based respectively on the methodologies of "Order of Acquisition of Durable Goods" proposed by Paroush (1963; 1965; 1973), Item Response Theory and Correspondence Analysis. The empirical analysis uses data from samples of the 2000 and 2010 Mexican Censuses available in the IPUMS. It appears that the order obtained does not depend on the methodological approach adopted and was very similar in 2000 and 2010. The identification of the order of acquisition makes it possible to locate each household on the wealth scale. The cumulative frequencies are then used to propose an alternative measure of poverty. Correlations between the extreme and moderate poverty estimates officially published by CONEVAL and those obtained from the order derived are computed and it appears that the correlation coefficient with extreme poverty reaches its maximum values both in 2000 and 2010 when the poverty rate according to the order of acquisition is defined by the percentage of households deprived of at least two goods. The main merit of an asset approach-based on the idea of an order of acquisition is that the value of the index provides us with a clear list of the goods and services that households own or do not own and an intuitive definition of the poverty line.

**Keywords:** asset index - correspondence analysis – item response theory - multidimensional poverty - Mexico- order of acquisition of durable goods

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## 1. Introduction: The asset approach to measuring standards of living

During the past fifteen years many papers have used information on the ownership of assets, like durable goods, to estimate the wealth of individuals or households. Filmer and Pritchett (1999; 2001) were probably the first to use such an approach which uses an aggregate index based on consumer durables owned by the household as a measure of household economic status (in the absence of data on per capita household expenditures).They analyzed the association between such an index and schooling outcomes. As stressed later on by Filmer and Scott (2012), data used to construct asset indices are simple to collect and frequently available.

Such an asset index has been used later on (see, Filmer and Scott, 2012, for more details) to explaininequality in health outcomes (e.g. Gwatkin et al., 2000, Bollen et al., 2002), child nutrition (e.g. Sahn and Stiffel, 2003), socio-economic inequalities in schooling (Ainsworth and Filmer, 2006), poverty change (e.g. Stifel and Christiaensen, 2007) or to target public programs (e.g. Schady and Araujo, 2006, for Ecuador).

Most studies have followed Filmer and Pritchett and used principal components analysis to estimate the weights used to aggregate asset indicators into an overall asset index. In the present paper we propose an ordinal approach to using data on assets when estimating the wealth of a household (or individual).

The general idea is as follows. Using various statistical approaches we show that there tend to be an order of acquisition of durable goods. More generally it seems that households behave as if they were implicitly assigning an order of importance to the various assets that they may acquire.

Our empirical analysis shows that such an order does not really depend on the statistical approach adopted to detect this order ("order of acquisition" algorithm; item response theory; correspondence analysis) and was very similar in 2000 and 2010. Moreover there is even a high correlation between the orders observed in the various Mexican states.We also show that such an order allows us to propose an alternative measure of poverty, based on the percentage of households owning a certain number of assets. In our empirical analysis we make a distinction between extreme and moderate poverty.

The present paper is organized as follows. Section 2 describes three methodologies deriving the sequence of acquisition of durable goods as an alternative to traditional asset approaches. Section 3 compares then the results obtained with each of the three methodologies using data collected from samples of the 2000 and 2010 Mexican Censuses. In section 4, we propose an alternative measure of poverty, based on the percentage of households owning a certain number of assets and compare our results with official poverty estimates published by CONEVAL. Concluding comments are given in Section 5.

## 2. The asset approach to measuring standards of living: theory

### 2.1. Traditional asset approaches

The starting point of such an approach is that consumption is assumed to be a better indicator of standard of living than income (less missing values, less under- or over-reporting) and that consumption is a function of wealth, as is well known from the literature on the consumption function.

A simple way of adopting such an approach is to use a simple count variable, the unweighted sum of asset ownership (see, Montgomery et al., 2000, as well as Case et al., 2004), as a proxy to consumption. Such a method implies however that having an oven and a dishwasher would be equivalent to having an oven and a car.

Another possibility is to regress per-capita expenditures on asset indicators in a data set that includes both sets of variables (see, Stifel and Christiaensen, 2007)

Item Response Theory is another technique that has been implemented. It uncovers a latent trait (household economic status) explaining the ownership of assets (see, Das et al., 2004, on IRT).

Some authors have used the so-called Multiple-indicator multiple-cause (MIMIC) (see, Montgomery and Hewett, 2005) technique where a latent factor determines the outcome of interest and is determined by a set of observed exogenous variables.

The most popular approach is however based on the use of principal components analysis (PCA). This is a statistical procedure that transforms a set of observations of (often correlated variables) into a set of linearly uncorrelated variables called principal components.PCA posits an underlying structure relating the indicator variables to a set of latent factors:

$$x_{1i} = \sum_{k=1}^{K} b_{1k}\, y_{ki} \qquad (1)$$

$$\ldots\ldots$$

$$x_{Ki} = \sum_{k=1}^{K} b_{Kk}\, y_{ki}$$

where $x_{ki}$ indicates whether asset *k* is owned by individual *i* , $y_{ki}$ is the value of principal component *k* for individual *i* and the *b*'s are coefficients. The *b*'s are estimated and the system is inverted to derive

$$y_{hi} = \sum_{k=1}^{K} a_{hk} x_{hi} \qquad (2)$$

for each principal component *h*.

The first principal component accounts then for as much of the variability in the data as possible. Each other principal component has the highest variance possible under the constraint that it is orthogonal to the other components. Note that the principal components are the eigenvectors of the covariance matrix of the original variables.More precisely given the set of variables the first principal component of the observations is the linear combination

$$y_{1i} = \sum_{k=1}^{K} a_{1k} \frac{x_{ki} - \overline{x_k}}{s_k} \qquad (3)$$

where $\overline{x_k}$ is the mean of the variables $x_{ki}$ and $s_k$ the corresponding standard deviation.

Note that the standardized variable $\frac{x_{ki} - \overline{x_k}}{s_k}$ has zero mean and variance $\lambda_1$, where $\lambda_1$ is the largest eigenvalue of the correlation matrix of the variables.The first principal component therefore gives an index providing maximum discrimination between households, with the assets which vary most across households being given larger weight. Clearly an asset which all households own will thus be given zero weight in the first principal component, as it explains none of the variation across households.

### 2.2. Deriving the sequence of acquisition of durable goods as an alternative to traditional asset approaches

#### 2.2.1. The order of acquisition of durable goods of Paroush

This approach has been introduced by Paroush (1963, 1965, 1973) forty years ago. It was borrowed from scale analysis in psychometrics. It provides a natural scale of the relative essentiality of various goods. Paroush suggested using the information on the order of acquisition of durable goods to estimatethe standard of livings of households. This approach has recently been applied by Deutsch and Silber (2008), Bérenger et al. (2013), Deutsch et al. (2013), Deutsch et al. (2015).

Suppose that consumers can buy 3 durables: A,B and C. Table 1 includes every possible outcome of owning these goods. It is composed of $2^3 = 8$ possible outcomes described.

A number 1 means that the consumer owns the good and the number 0 means that the consumer does not own the good. We define the possible outcomes as the consumer's profiles.

If we assume that the order of acquisition is A,B and C, then all the consumers will be distributed along the path of acquisition with profiles, 1-4 and there will be no consumers with profiles 5-8. In this case we say that there is a perfect scale.

If we now rank in this case the consumers according to the commodities they own, there is a one to one correspondence between the profile of the consumer and the rank of the consumers. In this case we can perfectly reproduce the profile of the consumer from its rank.

Obviously when comparing actual figures, some consumers may deviate from the path of acquisition but we can still conclude that there is a path which characterizes a dominant order of acquisition. Suppose, for example, a consumer with the profile 0,1,0 (profile 6 in Table 1).If the order of acquisition is A,B and C, it is easy to verify that the deviation between this profile X and the four relevant profiles 1, 2, 3 and 4 are respectively 1,2,1,2 and so the smallest deviation is 1 which corresponds to profiles 1 or 3.

Assume $S_i$ is the smallest deviation for household with profile $i$ and $N_i$ is the number of such households. Guttman (1950)defined the reproducibility index $R$ as

$$0.5 \leq R = 1 - \frac{\sum_i N_i S_i}{k \sum_i N_i} \leq 1$$

where $k$ is the number of goods.He proved that this index varies between 0.5 and 1.

When there is a perfect scale $S_i$ =0 for all consumers and $R$ =1.The calculation of the index of reproducibility assumes a given order of acquisition.Paroush suggested to find the coefficient of reproducibility for all the possible orders of acquisition and estimate the population's order of acquisition as the order of acquisition with the highest coefficient $R$, provided that it is greater than 0.9.

Estimating the order of acquisition requires a very high number of computations. Assume there are 9 goods (as is the case in our empirical illustration). Then, for each individual household $i$ in the sample, the determination of the minimum distance $S_i$ from his profile to one of the possible profiles in the path of acquisition is based on 10 comparisons. In our illustration, in the state of Mexico, for example, we have 213 890 observations so that 2 138 900 (213 890 x 10) comparisons are needed in order to determine the reproducibility index $R$ for a given order of acquisition. But this procedure has to be repeated 9! = 362 880 times which is the total number of possible order of acquisition resulting from 9 durable goods.The total number of iterations needed to find the order of acquisition with the highest index of reproducibility $R$ is then

2 138 900 x 362 880 = 7.762 x $10^{11}$.

Table 1
Possible orders of acquisition when there are 3 goods.

| Ownership Profile | The household owns good A | The household owns good B | The household owns good C |
|---|---|---|---|
| 1 | 0 | 0 | 0 |
| 2 | 1 | 0 | 0 |
| 3 | 1 | 1 | 0 |
| 4 | 1 | 1 | 1 |
| 5 | 0 | 1 | 1 |
| 6 | 0 | 1 | 0 |
| 7 | 0 | 0 | 1 |
| 8 | 1 | 0 | 1 |

**2.2.2. Item response Theory (IRT)**

IRT has been originally used to analyze the results of psychometric tests. IRT models the response of each examinee of a given ability to each item in the test. IRT is based on the idea that the probability of a correct response to an item is a mathematical function of person and item parameters. The person parameter is assumed to be a single latent trait or dimension, like the intelligence of the individual. Parameters on which items are characterized include, among others, their difficulty or severity (their location on the difficulty range), the degree of discrimination (slope) representing how steeply the rate of success of individuals varies with their ability.

The first parameter, the severity (difficulty), is then the location of the S-shaped curve along the x-axis, more specifically the position on the x-axis reached when there is a probability of 0.5 on the y-axis. Because the curves obtained (known as Item Response Curves, ICCs) are monotonic, the model, when applied to the analysis of deprivation, will assume that each item can be ranked according to its position on the latent deprivation scale. The second parameter shapes the steepness of the ICC, and shows how well each item discriminates between the deprived and non-deprived respondents. All these parameters are estimated by Maximum Likelihood. As mentioned previously, Item Response Theory

(IRT) models have also been used in the measurement of deprivation because poverty is after all also a latent variable difficult to measure (see, for example the works of Dickes (1983, 1989), Gailly and Hausman (1984), Pérez-Mayo (2004 and 2005), Cappellari and Jenkins (2006), Ayala and Navarro (2007 and 2008), Dickes and Fusco (2008), Guio, Gordon and Marlier (2012) and Szeles and Fusco (2013) ).

**2.2.3. Correspondence analysis**

Correspondence analysis was introduced by Benzécri and Benzécri (1980) and his French school. It is an exploratory data analytic technique aiming at analyzing simple two-way (or multi-way) tables where some measure of correspondence is assumed to exist between the rows and columns. Correspondence analysis transforms complex data into a simple description of the implicit information given by the data. Correspondence analysis provides a graphical display of row and column points in biplots, which helps discovering some structural relationships that may exist between the variables and the observations.Correspondence analysis (CA) is somehow a special case of principal components analysis (PCA) but CA and PCA have each specific uses. Principal components analysis is a useful tool when one has tables consisting of continuous measurement, whereas correspondence analysis is typically applied to the case of contingency tables. Assume a contingency table that has *I* rows and *J* columns. The plot given by a correspondence analysis provides a set of (*I*+*J*) points, *I* points corresponding to the rows and *J* points to the columns. If two row points are close, one can then conclude that their conditional distributions across the columns are similar. Given the symmetry of the role played by lines and columns in correspondence analysis, we can also conclude that when two column points are close on the bi-plot provided by the correspondence analysis their conditional distributions across the rows are similar.

Like principal components analysis, correspondence analysis provides the researcher with principal components which are orthogonal. Each component is a linear combination of the variables on one hand, the observations on the other. The coefficients of these variables (observations) for the first two components give us the coordinates that allow us to plot these variables (observations) in the graph previously mentioned. We limited ourselves to the first factor.

Let us therefore assume now that the *K* primary indicators are categorical ordinal and that the $I^k$ indicator has $J^k$ categories. Let us now call *X(N,J)* the matrix corresponding to the *N* observations on the *K* indicators which are now decomposed into $J^k$ variables. Note that $J = \sum_{k=1}^{K} J^k$ represents now the total number of categories. Call $N_{.j}$ the absolute frequency of category *j*. Clearly $N_{.j}$ is equal to the sum of column *j* of the matrix *X*. Let $N$ refer to the sum of all the elements of the matrix *X*. Let also $f_{.j}$ be the relative frequency $(N_j/N)$ and let $f_i$ be the sum of the $i$th line of matrix X with $f_{i.} = \sum_j f_{ij}$ , $f_{ij}$ where $f_{ij}$ is the relative frequency of cell (i,j).

Let $f_i^j$ be equal to the ratio $(f_{ij}/f_{i.})$. Finally call $\{f_i^j\}$ the set of all the $f_i^j$ for a given observation *i* (*j* = 1 to *J*). This set will be called the profile of observation *i*.

As stressed previously CA is a PCA process applied to the matrix *X*, but with the $\chi^2$- metric on row/column profiles, instead of the usual Euclidean metric. This $\chi^2$- metric is in fact a special case of the Mahalanobis distance developed in the 1930s.

This metric defines the distance $d[\{f_i^j\},\{f_{i'}^j\}]$ between two profiles *i* and *i'* as

$$d[\{f_i^j\},\{f_{i'}^j\}] = \sum_{j=1}^{J} \left(\frac{1}{f_{.j}}\right)\left[f_i^j - f_{i'}^j\right]^2$$

Note that the only difference with the Euclidean metric lies in the term $\left(\frac{1}{f_{.j}}\right)$. This term indicates that categories which have a low frequency will receive a higher weight in the computation of distance. As a consequence CA will be overweighting the smaller categories within each primary indicator.

## 3. The asset approach to measuring standards of living: empirical illustrations based on 2000 and 2010 Mexico censuses.

Data were collected from samples of the 2000 and 2010 Mexican Censuses available in the Integrated Public Use Microdata Series, International. To derive the priority pattern of acquisition of assets and the standards of living of the households, we use the following nine assets: phone (1), car (2), hot water heater (3), computer (4), washing machine (5), refrigerator (6), television (7), radio (8) and toilet (9).

Based on the approach of Paroush, Table 2 presents the most common order of acquisition of durable goods of the households for each Mexican state in 2000. While it is clear that there are inevitably some households that deviate from the most common priority pattern, in each case the coefficients of reproducibility are high and greater than 0.9, confirming a situation close to a perfect scale. Thus, in most of the states, the more common order of importance seems to be toilet, television, radio, refrigerator, washing machine. Then, depending on the states, we have hot water heater, car or phone, and finally computer. Almost similar patterns are observed in Table 3 for 2010 although there have been some changes in the ranking of goods and services. While the list of the four first goods prioritized by households remains the same, access to toilet becomes more essential in 2010 than in 2000 in some states. Moreover, at the difference of what was observed in 2000, households seem now to give preference to the acquisition of a refrigerator before that of a radio.Among states, the most numerous changes are registered in Campeche, Quintana Roo and Tabasco.

Tables 4 and 5 provide the rankings of the assets based on the estimation of the severity parameter for each durable good using the Item Response Model. As shown in Tables 4 and 5, the IRT provides almost the same orders as those derived from the Paroush approach for each state. Thus, in 2000, in every state, the first items are access to toilet, television, radio, refrigerator, washing machine and the last one is a computer. This means that if a household does not own the first four goods, the probability that it owns the other goods is lower than 0.5. We observe only some slight differences between the two approaches. They are mainly related to the ranking between the three last goods in the order of acquisition. In particular, while car moves higher up in the pattern of acquisition, phone and hot water heater have a higher position than in the Paroush approach. Priority patterns of acquisition are also very similar between IRT and the Paroush approach in 2010. In particular, they confirm that a refrigerator moved higher up in the priorities of households.

Finally, we used correspondence analysis (CA), a technique quite widely applied to obtain a composite asset index, to derive a ranking of the goods acquired by households. The ranking is based on the factor score of the category "owning the good" on the first factorial axis. As shown in Tables 6 and 7, CA provides similar

Table 2: The order of acquisition in 2000, based on the Paroush algorithm

| State | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Reprod. Index |
|---|---|---|---|---|---|---|---|---|---|---|
| AGS | 7 | 9 | 8 | 6 | 5 | 3 | 2 | 1 | 4 | 0.9424 |
| BCN | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 0.9444 |
| BCS | 9 | 7 | 8 | 6 | 2 | 5 | 1 | 3 | 4 | 0.9312 |
| CAMP | 9 | 7 | 8 | 6 | 5 | 1 | 2 | 3 | 4 | 0.9432 |
| COA | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 0.9455 |
| COL | 9 | 7 | 8 | 6 | 5 | 1 | 2 | 3 | 4 | 0.9436 |
| CHAP | 9 | 8 | 7 | 6 | 5 | 1 | 2 | 3 | 4 | 0.9648 |
| CHI | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 0.9461 |
| DIF | 9 | 7 | 8 | 6 | 3 | 5 | 1 | 2 | 4 | 0.9527 |
| DUR | 7 | 8 | 9 | 6 | 3 | 5 | 2 | 1 | 4 | 0.9251 |
| GTO | 7 | 8 | 9 | 6 | 5 | 3 | 1 | 2 | 4 | 0.9428 |
| GRO | 8 | 7 | 9 | 6 | 5 | 1 | 2 | 3 | 4 | 0.9471 |
| HGO | 8 | 9 | 7 | 6 | 3 | 5 | 2 | 1 | 4 | 0.9411 |
| JAL | 7 | 9 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 0.9397 |
| MEX | 7 | 8 | 9 | 6 | 5 | 3 | 1 | 2 | 4 | 0.9429 |
| MIC | 9 | 7 | 8 | 6 | 5 | 3 | 2 | 1 | 4 | 0.9353 |
| MOR | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 0.9408 |
| NAY | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 0.9404 |
| NLE | 9 | 7 | 8 | 6 | 5 | 1 | 3 | 2 | 4 | 0.9493 |
| OAX | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 0.9628 |
| PUE | 9 | 8 | 7 | 6 | 3 | 5 | 1 | 2 | 4 | 0.9464 |
| QRO | 8 | 7 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 0.9414 |
| ROO | 9 | 8 | 7 | 6 | 5 | 1 | 3 | 2 | 4 | 0.9409 |
| SLP | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 0.9469 |
| SIN | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 3 | 4 | 0.9363 |
| SON | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 0.9301 |
| TAB | 9 | 7 | 8 | 6 | 5 | 1 | 2 | 3 | 4 | 0.9557 |
| TAM | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 0.9445 |
| TLX | 8 | 7 | 9 | 6 | 3 | 5 | 2 | 1 | 4 | 0.9366 |
| VER | 9 | 8 | 7 | 6 | 5 | 1 | 3 | 2 | 4 | 0.9563 |
| YUC | 7 | 8 | 9 | 6 | 5 | 1 | 2 | 3 | 4 | 0.9400 |
| ZAC | 7 | 8 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 0.9301 |

Note: The table should be interpreted as follows: for the state of Aguascalientes commodity 7 is the first in the path of acquisition, commodity 9 the second, and so on.The state to which each code refers is given in Table A.1 in the Appendix.

Table 3: The order of acquisition in 2010, based on the Paroush algorithm

| State | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Reprod. Index |
|---|---|---|---|---|---|---|---|---|---|---|
| AGS | 7 | 9 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 0.9300 |
| BCN | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 0.9411 |
| BCS | 9 | 7 | 6 | 8 | 2 | 5 | 3 | 4 | 1 | 0.9250 |
| CAMP | 9 | 7 | 6 | 5 | 8 | 2 | 4 | 1 | 3 | 0.9336 |
| COA | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 0.9394 |
| COL | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 3 | 4 | 0.9280 |
| CHAP | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 4 | 3 | 0.9541 |
| CHI | 9 | 7 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 0.9387 |
| DIF | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 4 | 2 | 0.9471 |
| DUR | 9 | 7 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 0.9163 |
| GTO | 7 | 9 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 0.9233 |
| GRO | 9 | 7 | 6 | 8 | 5 | 1 | 2 | 4 | 3 | 0.9283 |
| HGO | 9 | 7 | 8 | 6 | 3 | 5 | 2 | 1 | 4 | 0.9216 |
| JAL | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 0.9259 |
| MEX | 7 | 9 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 0.9278 |
| MIC | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 0.9176 |
| MOR | 9 | 7 | 6 | 8 | 5 | 1 | 3 | 2 | 4 | 0.9209 |
| NAY | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 3 | 4 | 0.9190 |
| NLE | 9 | 7 | 6 | 5 | 8 | 2 | 3 | 1 | 4 | 0.9392 |
| OAX | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 0.9359 |
| PUE | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 0.9306 |
| QRO | 7 | 9 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 0.9194 |
| ROO | 9 | 7 | 6 | 5 | 8 | 2 | 4 | 1 | 3 | 0.9298 |
| SLP | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 0.9300 |
| SIN | 7 | 9 | 6 | 5 | 8 | 2 | 1 | 4 | 3 | 0.9265 |
| SON | 9 | 7 | 6 | 5 | 8 | 2 | 3 | 1 | 4 | 0.9216 |
| TAB | 9 | 7 | 6 | 5 | 8 | 2 | 4 | 1 | 3 | 0.9435 |
| TAM | 9 | 7 | 6 | 5 | 8 | 2 | 1 | 3 | 4 | 0.9317 |
| TLX | 9 | 7 | 8 | 6 | 3 | 5 | 2 | 1 | 4 | 0.9216 |
| VER | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 0.9373 |
| YUC | 7 | 9 | 8 | 6 | 5 | 2 | 1 | 4 | 3 | 0.9294 |
| ZAC | 7 | 9 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 0.9215 |

Note: The table should be interpreted as follows: for the state of Aguascalientes commodity 7 is the first in the path of acquisition, commodity 9 the second, and so on.The state to which each code refers is given in Table A.1 in the Appendix.

Table 4: Order of Importance of the various items in 2000, derived from Item Response Theory

| State | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Nb. of obs. |
|---|---|---|---|---|---|---|---|---|---|---|
| AGS | 7 | 9 | 8 | 6 | 5 | 3 | 2 | 1 | 4 | 18756 |
| BCN | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 3 | 4 | 35542 |
| BCS | 9 | 7 | 8 | 6 | 2 | 5 | 1 | 3 | 4 | 9140 |
| CAMP | 9 | 7 | 8 | 6 | 5 | 1 | 2 | 3 | 4 | 15473 |
| COA | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 46751 |
| COL | 9 | 7 | 8 | 6 | 5 | 1 | 2 | 3 | 4 | 12684 |
| CHAP | 9 | 8 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 94490 |
| CHI | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 71553 |
| DIF | 9 | 7 | 8 | 6 | 3 | 5 | 1 | 2 | 4 | 187987 |
| DUR | 7 | 8 | 9 | 6 | 3 | 5 | 2 | 1 | 4 | 35091 |
| GTO | 7 | 8 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 79631 |
| GRO | 8 | 7 | 9 | 6 | 5 | 1 | 2 | 3 | 4 | 74305 |
| HGO | 8 | 9 | 7 | 6 | 3 | 5 | 2 | 1 | 4 | 61128 |
| JAL | 7 | 9 | 8 | 6 | 5 | 3 | 2 | 1 | 4 | 147041 |
| MEX | 7 | 8 | 9 | 6 | 5 | 3 | 1 | 2 | 4 | 248772 |
| MIC | 9 | 7 | 8 | 6 | 5 | 3 | 2 | 1 | 4 | 103754 |
| MOR | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 36780 |
| NAY | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 18730 |
| NLE | 9 | 7 | 8 | 6 | 5 | 1 | 3 | 2 | 4 | 81092 |
| OAX | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 155451 |
| PUE | 9 | 8 | 7 | 6 | 3 | 5 | 2 | 1 | 4 | 130978 |
| QRO | 8 | 7 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 27511 |
| ROO | 9 | 8 | 7 | 6 | 5 | 1 | 3 | 2 | 4 | 16206 |
| SLP | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 57097 |
| SIN | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 3 | 4 | 41081 |
| SON | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 58957 |
| TAB | 9 | 7 | 8 | 6 | 5 | 1 | 2 | 3 | 4 | 39540 |
| TAM | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 57120 |
| TLX | 8 | 7 | 9 | 6 | 3 | 5 | 2 | 1 | 4 | 30153 |
| VER | 9 | 8 | 7 | 6 | 5 | 3 | 1 | 2 | 4 | 185129 |
| YUC | 7 | 8 | 9 | 6 | 5 | 1 | 2 | 3 | 4 | 52533 |
| ZAC | 7 | 8 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 43294 |

Note: The table should be interpreted as follows: for the state of Aguascalientes commodity 7 is the first in the path of acquisition, commodity 9 the second, and so on.The state to which each code refers is given in Table A.1 in the Appendix.

Table 5: Order of Importance of the various items in 2010, derived from Item Response Theory

| State | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Nb. of obs. |
|---|---|---|---|---|---|---|---|---|---|---|
| AGS | 7 | 9 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 16252 |
| BCN | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 23830 |
| BCS | 9 | 7 | 6 | 8 | 2 | 5 | 3 | 4 | 1 | 8712 |
| CAMP | 9 | 7 | 6 | 5 | 8 | 2 | 1 | 4 | 3 | 14982 |
| COA | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 47091 |
| COL | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 3 | 4 | 17931 |
| CHAP | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 4 | 3 | 192268 |
| CHI | 9 | 7 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 76319 |
| DIF | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 4 | 2 | 93858 |
| DUR | 9 | 7 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 46081 |
| GTO | 7 | 9 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 77791 |
| GRO | 9 | 7 | 6 | 8 | 5 | 1 | 2 | 4 | 3 | 149487 |
| HGO | 9 | 7 | 8 | 6 | 3 | 5 | 2 | 1 | 4 | 80053 |
| JAL | 9 | 7 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 154639 |
| MEX | 7 | 9 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 213890 |
| MIC | 9 | 7 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 128916 |
| MOR | 9 | 7 | 6 | 8 | 5 | 1 | 3 | 2 | 4 | 38365 |
| NAY | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 3 | 4 | 27058 |
| NLE | 9 | 7 | 6 | 5 | 8 | 2 | 3 | 1 | 4 | 70438 |
| OAX | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 371021 |
| PUE | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 217047 |
| QRO | 7 | 9 | 6 | 8 | 5 | 2 | 3 | 1 | 4 | 25470 |
| ROO | 9 | 7 | 6 | 5 | 8 | 2 | 4 | 1 | 3 | 18144 |
| SLP | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 63959 |
| SIN | 7 | 9 | 6 | 5 | 8 | 2 | 1 | 4 | 3 | 31801 |
| SON | 9 | 7 | 6 | 5 | 8 | 2 | 3 | 1 | 4 | 68743 |
| TAB | 9 | 7 | 6 | 5 | 8 | 2 | 1 | 4 | 3 | 25291 |
| TAM | 9 | 7 | 6 | 5 | 8 | 2 | 1 | 3 | 4 | 54355 |
| TLX | 9 | 7 | 8 | 6 | 3 | 5 | 2 | 1 | 4 | 58114 |
| VER | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 247274 |
| YUC | 7 | 9 | 8 | 6 | 5 | 2 | 1 | 4 | 3 | 97191 |
| ZAC | 7 | 9 | 6 | 8 | 5 | 3 | 2 | 1 | 4 | 54761 |

Note: The table should be interpreted as follows: for the state of Aguascalientes commodity 7 is the first in the path of acquisition, commodity 9 the second, and so on.The state to which each code refers is given in Table A.1 in the Appendix.

Table 6: Order of Importance of the various items in 2000, derived from Correspondence Analysis

| State | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Nb. of obs. |
|---|---|---|---|---|---|---|---|---|---|---|
| AGS | 7 | 8 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 18756 |
| BCN | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 35542 |
| BCS | 9 | 8 | 7 | 6 | 2 | 5 | 1 | 3 | 4 | 9140 |
| CAMP | 9 | 8 | 7 | 5 | 6 | 1 | 2 | 3 | 4 | 15473 |
| COA | 9 | 8 | 7 | 6 | 5 | 2 | 3 | 1 | 4 | 46751 |
| COL | 9 | 8 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 12684 |
| CHAP | 9 | 8 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 94490 |
| CHI | 8 | 9 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 71553 |
| DIF | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 2 | 4 | 187987 |
| DUR | 8 | 7 | 9 | 6 | 3 | 5 | 2 | 1 | 4 | 35091 |
| GTO | 8 | 7 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 79631 |
| GRO | 8 | 7 | 9 | 6 | 5 | 1 | 2 | 3 | 4 | 74305 |
| HGO | 8 | 9 | 7 | 6 | 3 | 2 | 5 | 1 | 4 | 61128 |
| JAL | 8 | 7 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 147041 |
| MEX | 8 | 7 | 9 | 6 | 5 | 3 | 1 | 2 | 4 | 248772 |
| MIC | 8 | 9 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 103754 |
| MOR | 8 | 7 | 9 | 6 | 5 | 3 | 1 | 2 | 4 | 36780 |
| NAY | 8 | 9 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 18730 |
| NLE | 9 | 8 | 7 | 6 | 5 | 1 | 2 | 3 | 4 | 81092 |
| OAX | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 155451 |
| PUE | 9 | 8 | 7 | 6 | 3 | 5 | 2 | 1 | 4 | 130978 |
| QRO | 8 | 7 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 27511 |
| ROO | 9 | 8 | 7 | 5 | 6 | 1 | 3 | 2 | 4 | 16206 |
| SLP | 9 | 8 | 7 | 6 | 5 | 2 | 3 | 1 | 4 | 57097 |
| SIN | 9 | 8 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 41081 |
| SON | 9 | 8 | 7 | 6 | 5 | 2 | 3 | 1 | 4 | 58957 |
| TAB | 9 | 8 | 7 | 6 | 5 | 1 | 2 | 3 | 4 | 39540 |
| TAM | 9 | 8 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 57120 |
| TLX | 8 | 7 | 9 | 6 | 3 | 5 | 2 | 1 | 4 | 30153 |
| VER | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 185129 |
| YUC | 8 | 7 | 9 | 5 | 6 | 1 | 2 | 3 | 4 | 52533 |
| ZAC | 8 | 7 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 43294 |

Note: The table should be interpreted as follows: for the state of Aguascalientes commodity 7 is the first in the path of acquisition, commodity 9 the second, and so on.The state to which each code refers is given in Table A.1 in the Appendix.

Table 7: Order of Importance of the various items in 2010, derived from Correspondence Analysis

| State | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Nb. of obs. |
|---|---|---|---|---|---|---|---|---|---|---|
| AGS | 7 | 9 | 8 | 6 | 5 | 3 | 2 | 1 | 4 | 16252 |
| BCN | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 23830 |
| BCS | 9 | 7 | 8 | 6 | 2 | 5 | 3 | 4 | 1 | 8712 |
| CAMP | 9 | 7 | 6 | 8 | 5 | 2 | 1 | 4 | 3 | 14982 |
| COA | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 47091 |
| COL | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 17931 |
| CHAP | 9 | 8 | 7 | 6 | 5 | 2 | 1 | 4 | 3 | 192268 |
| CHI | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 76319 |
| DIF | 9 | 7 | 8 | 6 | 5 | 3 | 1 | 4 | 2 | 93858 |
| DUR | 8 | 9 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 46081 |
| GTO | 7 | 8 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 77791 |
| GRO | 8 | 9 | 7 | 6 | 5 | 1 | 2 | 4 | 3 | 149487 |
| HGO | 9 | 8 | 7 | 6 | 3 | 5 | 2 | 1 | 4 | 80053 |
| JAL | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 154639 |
| MEX | 7 | 9 | 8 | 6 | 5 | 3 | 2 | 1 | 4 | 213890 |
| MIC | 8 | 9 | 7 | 6 | 5 | 2 | 3 | 1 | 4 | 128916 |
| MOR | 9 | 7 | 8 | 6 | 5 | 1 | 2 | 3 | 4 | 38365 |
| NAY | 8 | 9 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 27058 |
| NLE | 9 | 7 | 8 | 6 | 5 | 2 | 3 | 1 | 4 | 70438 |
| OAX | 9 | 8 | 7 | 6 | 5 | 1 | 2 | 3 | 4 | 371021 |
| PUE | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 | 4 | 217047 |
| QRO | 8 | 7 | 9 | 6 | 5 | 2 | 3 | 1 | 4 | 25470 |
| ROO | 9 | 7 | 8 | 5 | 6 | 2 | 4 | 1 | 3 | 18144 |
| SLP | 9 | 8 | 7 | 6 | 5 | 2 | 3 | 1 | 4 | 63959 |
| SIN | 7 | 9 | 6 | 8 | 5 | 2 | 1 | 4 | 3 | 31801 |
| SON | 9 | 8 | 7 | 6 | 5 | 2 | 3 | 1 | 4 | 68743 |
| TAB | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 4 | 3 | 25291 |
| TAM | 9 | 7 | 8 | 6 | 5 | 2 | 1 | 3 | 4 | 54355 |
| TLX | 9 | 7 | 8 | 6 | 3 | 5 | 2 | 1 | 4 | 58114 |
| VER | 9 | 8 | 7 | 6 | 5 | 2 | 1 | 3 | 4 | 247274 |
| YUC | 7 | 8 | 9 | 5 | 6 | 2 | 1 | 4 | 3 | 97191 |
| ZAC | 8 | 7 | 9 | 6 | 5 | 3 | 2 | 1 | 4 | 54761 |

Note: The table should be interpreted as follows: for the state of Aguascalientes commodity 7 is the first in the path of acquisition, commodity 9 the second, and so on.The state to which each code refers is given in Table A.1 in the Appendix.

results to those of IRT and Paroush. However, a closer look makes it possible to highlight some slight differences, particularly concerning the first four goods acquired. When comparing the ordering obtained with that based on IRT or the Paroush approach, we observe, for instance, that in 2000 a radio seems to be more essential than a television. This is no longer the case in 2010. In addition, while the refrigerator moves from the 4th to the 3th rank according to IRT and Paroush, it remains the fourth item acquired by the households in 2010 according to CA. We also observe that the greatest number of rank changes is registered in Campeche, Quintana Roo and Tabasco, as well as in Sinaloa and Yucatan.

In order to strengthen our findings, we also computed, separately for 2000 and 2010, rank correlations between the orderings obtained according to each of the three approaches presented in Tables 2 to 7. As shown in Table 8, the correlation coefficients between the three approaches are very high in both 2000 and 2010, corroborating the similarity between the rankings

Table 8: Rank correlations between the orders of acquisition observed in 2000 and 2010

| | Paroush approach & IRT | Paroush approach & CA | IRT & CA |
|---|---|---|---|
| 2000 | 0.994 | 0.967 | 0.972 |
| 2010 | 0.990 | 0.919 | 0.928 |

Table 9a: Correlations between the orders of the various states in 2000

| The Approach | Lowest Correlation | Highest Correlation |
|---|---|---|
| Order of Acquisition of Paroush | 0.800 | 1 |
| Item Response Theory | 0.800 | 1 |
| Correspondence Analysis | 0.800 | 1 |

Table 9b: Correlations between the orders of the various states in 2010

| The Approach | Lowest Correlation | Highest Correlation |
|---|---|---|
| Order of Acquisition of Paroush | 0.750 | 1 |
| Item Response Theory | 0.750 | 1 |
| Correspondence Analysis | 0.750 | 1 |

among durable goods derived from the three approaches. Moreover, we can observe in Table 8 that the patterns of acquisition of durable goods between 2000 and 2010 are highly correlated regardless of the approach selected and the state analyzed.

In addition, Table 9a for 2000 and Table 9b for 2010 give the rank correlations between the orders of acquisition of durable goods between the different states of Mexico for the three approaches. We observe that the range of variation of the rank correlations is similar for the three approaches.

The rank correlations are very high. The lowest are equal to 0.800 in 2000 (Baja California and Hidalgo and Sinaloa sharing the same order as BCN and HGO) and 0.750 in 2010 (ROO and SIN with the same order and HGO and TLX also having the same order). The highest correlations are equal to 1 both in 2000 and in 2010. The value of 1 indicates that there are some groups of states that share similar orders of acquisition (see Tables A-2 to A-7 in Appendix).

## 4. Using the concept of order of acquisition to estimate poverty

As mentioned in section 1, current research on poverty makes an extensive use of asset indices as an alternative to reliable income or expenditure data to provide measures of poverty. Even though an asset index is likely to be a poor proxy for a household's current income or expenditure, it has been found to be quite a reliable proxy for a household's long-run economic status/wealth. However, in most studies, one of the main limitations of an asset approach to poverty measurement is the loss of the multidimensionality that characterizes the indicators included in the index. In addition, since the index provides only a ranking of the households according to their long-run economic status, it is not easy to define a threshold value for poverty measurement. Indeed, the value of the index has no an intuitive meaning since it is supposed to measure a latent trait. One way to proceed that is commonly used in the literature on asset indices is to use a relative approach taking into account the overall distribution of the index of standard of living. When comparisons are made over time or across countries, as often suggested by the World Bank, it is also possible to consider as poor the bottom 40% of the distribution of the asset index. A similar procedure would be to use the percentage of people living below the national monetary poverty line as a benchmark for making monetary and non-monetary comparisons over time in a given country. None of these studies makes use of the ordinal nature of the indicators that compose the asset index. Yet, the identification of an underlying pattern of acquisition of durable goods among households makes it possible to derive a poverty measure that provides meaningful information based on the number of deprivations and also on the identification of specific deprivations suffered by the poor. The identification of the order of acquisition permits to locate each household on the same scale from which an index of the standard of living giving the number of goods and services owned may be derived. The position of the household on the acquisition order reflects its wealth or financial ability so that we may expect that the more financially constrained a given household is, the lower the number of goods owned, since a household is supposed, in allocating its resources, to give priority to the fulfillment of the more basic needs. Thus, we can use the cumulative frequencies of households having no durable goods, one durable good,…, nine durable goods. The cumulative frequencies contain all the information we need to identify specific deprivations. We could use these cumulative frequencies to derive the percentage of poor in each state by setting an absolute poverty line according to a given number of goods that a household should at least own in order to be considered as non-poor. Although the poverty line could be set arbitrarily as reflecting the preference of the social planner towards those people suffering from deprivation on all items or those suffering on at least one item, it could also be defined by considering the correlations between poverty measures as officially published in Mexico and those derived from the cumulative frequencies, by varying the threshold value of the number of goods on the acquisition path.

While in Mexico poverty has been traditionally measured via income[1], starting in 2009 the National Council for the Evaluation of the Social Development Policy (CONEVAL) uses a multidimensional poverty approach as official poverty measure. This new definition of poverty takes into account the economic well-being as well as social rights guaranteed by the National Constitution. Economic well-being is gauged first by comparing per

1. Until 2009, official poverty measures were based on three income poverty lines drawn on Sen's capabilities. Thus food, capacities and patrimonial poverty lines were supposed to reflect the functioning, capabilities and basic needs of people (Ortega Diaz, 2014)

capita income with a poverty line based on a food poverty line[2] and this comparison defines what has been labelled extreme poverty. A comparison with a threshold corresponding to basic needs (also named as well-being line) defines what has been called moderate poverty. The social rights dimension is assessed via a social deprivation index which includes six non-monetary components such as educational gap, access to health services, access to social security, quality and spaces of the dwelling, access to basic services in the dwelling, and access to food. Each of the six deprivations is measured by a single binary indicator and combined in a single index with equal weights. Thus, CONEVAL index identifies three levels of poverty:

- Extreme poverty reflects conditions where individuals have an income below the food poverty line (also called the minimum well-being line) and suffer from at least three social deprivations.
- Moderate poverty refers to a situation where individuals have an income above the minimum well-being line but below the well-being line, and they endure at least one social deprivation.
- Multidimensional poverty corresponds to the case where the individual income according to the well-being line is insufficient to satisfy every individual's needs and where at least one of the social rights is not guaranteed. Therefore, multidimensional poverty is the sum of extreme and moderate poverty.

Table 10 shows poverty estimations for extreme and moderate poverty at the national and state level in 2010, as published by CONEVAL (2010). The results indicate that poverty is heterogeneously distributed between Mexican states. These estimations are used as benchmark to identify the number of goods on the acquisition path that provide poverty estimates most closely linked to moderate and extreme poverty. Tables 11 and 12 give the correlations between the cumulative number of goods owned, based on the acquisition order derived from IRT, and the official 2010 poverty rates given in Table 10. Despite the fact that poverty measures based on the order of acquisition are not directly comparable to the official ones in 2010, as shown in Table 11, the correlations describe a U-shaped relationship between the acquisition order based measure and both extreme and moderate poverty in 2000 as well as in 2010. However, correlations are higher for extreme poverty than for moderate poverty suggesting that the information provided by poverty measures derived from

Table 10: Data on poverty by State in Mexico in 2010

| Code | State | Rate of Poverty | |
|---|---|---|---|
| | | Extreme Poverty | Moderate Poverty |
| AGS | Aguascalientes | 3.7 | 34.6 |
| BCN | Baja California | 3.5 | 28.6 |
| BCS | Baja California Sur | 4.6 | 26.3 |
| CAMP | Campeche | 13.6 | 36.7 |
| COA | Coahuila | 3.0 | 25.0 |
| COL | Colima | 2.5 | 32.3 |
| CHAP | Chiapas | 38.3 | 40.2 |
| CHI | Chihuahua | 6.6 | 32.6 |
| DIF | Distrito Federal | 2.2 | 26.5 |
| DUR | Durango | 10.3 | 41.0 |
| GTO | Guanajuato | 8.4 | 40.1 |
| GRO | Guerrero | 31.6 | 36.0 |
| HGO | Hidalgo | 13.5 | 41.4 |
| JAL | Jalisco | 5.2 | 31.8 |
| MEX | Mexico | 8.6 | 34.4 |
| MIC | Michoacan | 13.5 | 41.3 |
| MOR | Morelos | 7.0 | 36.6 |
| NAY | Nayarit | 8.2 | 33.1 |
| NLE | Nuevo Leon | 1.9 | 19.2 |
| OAX | Oaxaca | 29.8 | 37.6 |
| PUE | Puebla | 16.7 | 44.5 |
| QRO | Queretaro | 7.4 | 34.1 |
| ROO | Quintana Roo | 6.3 | 28.3 |
| SLP | San Luis Potosi | 15.5 | 37.1 |
| SIN | Sinaloa | 5.4 | 31.1 |
| SON | Sonora | 5.3 | 28.5 |
| TAB | Tabasco | 13.6 | 43.7 |
| TAM | Tamaulipas | 5.6 | 33.7 |
| TLX | Tlaxcala | 10.0 | 50.6 |
| VER | Veracruz | 19.3 | 39.2 |
| YUC | Yucatan | 11.7 | 36.8 |
| ZAC | Zacatecas | 10.8 | 49.4 |
| | Mexican United States | 11.4 | 34.9 |

Source: Report of Poverty in Mexico, 2010. Coneval (Chart 1.4).

2. The food poverty line or the minimum well-being threshold refers to the minimum household income per capita to afford a basic food basket to ensure adequate nutrition. The well-being threshold corresponds to the minimum household income per capita required to acquire the necessary goods and services that satisfy food and non-food needs. For more details, see CONEVAL (2010).

the order of acquisition is basically similar to that given by extreme poverty measures. The correlation coefficient with extreme poverty reaches its maximum values above 0.9 both in 2000 and 2010, when the poverty rate according to the order of acquisition is defined by the percentage of households deprived of at least two goods. While correlations with moderate poverty have lower values, the highest values are equal to 0.648 in 2000 and 0.444 in 2010. This can be explained by the fact that moderate poverty embraces a broader concept of well-being than the order of acquisition based asset index. Even in that case, the highest correlation would lead to consider as poor households those that endure deprivations in at least three goods in 2000 and four goods in 2010. Having identified a poverty line for the order of acquisition, it is instructive to combine the information concerning the poverty line and that relative to the path of acquisition to identify specific deprivation indicators that reflect essential requirements.

Table 11: Correlations between cumulative percentages of durable goods owned (based on IRT) for year 2000 and official 2010 poverty data

| Variables correlated | Extreme Poverty | Moderate Poverty |
|---|---|---|
| Cumulative percentage of those with zero good in 2000 | 0.817 | 0.385 |
| Cumulative percentage of those with one good in 2000 | 0.932 | 0.388 |
| Cumulative percentage of those with two goods in 2000 | 0.936 | 0.490 |
| Cumulative percentage of those with three goods in 2000 | 0.867 | 0.648 |
| Cumulative percentage of those with four goods in 2000 | 0.856 | 0.608 |
| Cumulative percentage of those with five goods in 2000 | 0.764 | 0.541 |

Table 12: Correlations between cumulative percentages of durable goods owned (based on IRT) for year 2010 and official 2010 poverty data

| Variables correlated | Extreme Poverty | Moderate Poverty |
|---|---|---|
| Cumulative percentage of those with zero good in 2010 | 0.551 | 0.149 |
| Cumulative percentage of those with one good in 2010 | 0.904 | 0.277 |
| Cumulative percentage of those with two goods in 2010 | 0.927 | 0.348 |
| Cumulative percentage of those with three goods in 2010 | 0.912 | 0.432 |
| Cumulative percentage of those with four goods in 2010 | 0.899 | 0.444 |
| Cumulative percentage of those with five goods in 2010 | 0.802 | 0.405 |
| Cumulative percentage of those with six goods in 2010 | 0.751 | 0.382 |

For example, adopting a poverty line set at two goods, we can conclude that the extremely poor identified by CONEVAL in 2010 are households that endure deprivations in at least seven items defining the acquisition order. As an illustration, in Chiapas where the incidence of extreme poverty is the highest, the poor are those that do not have a radio, a refrigerator, a washing machine, a car, a phone, a computer and a hot water heater (see the order of acquisition in Table 5). For moderate poverty, setting a poverty threshold of four goods suggests that the moderate poor are those that suffer from at least five deprivations. For example, in Nuevo Leon, the moderate poor are less likely to own a car, a hot water heater, a phone and a computer (see the order of acquisition in Table 5).

## 5. Conclusion

While most of the literature on asset based indices takes a cardinal approach to the measurement of household wealth/economic status, we proposed three ways of deriving such an asset index when the variables are all dichotomous. The basic idea is that households behave as if they were implicitly assigning an order of importance to the various assets that they may acquire. Such an order has been based respectively on the methodologies of "Order of Acquisition of Durable Goods" proposed by Paroush (1963; 1965; 1973), Item Response Theory and Correspondence Analysis. In our empirical analysis, we used data from samples of the 2000 and 2010 Mexican Censuses available in the IPUMS. The results obtained showed that such an order did not really depend on the methodological approach adopted to detect it and was very similar in 2000 and 2010. Moreover there was even a high correlation between the orders

observed in the various Mexican states. Since the identification of the order of acquisition made it possible to locate each household on the wealth scale, we then used the cumulative frequencies to propose an alternative measure of poverty. The analysis of the correlations between extreme and moderate poverty estimates officially published by CONEVAL and those obtained from the order derived described a U-shaped relationship between the acquisition order based measure and both extreme and moderate poverty, in 2000 as well as in 2010. The correlation coefficient with extreme poverty reaches its maximum values both in 2000 and 2010 when the poverty rate according to the order of acquisition is defined by the percentage of households deprived of at least two goods. Therefore, the extremely poor in 2010 as identified by CONEVAL are households that endure deprivations in at least seven of the items defining the acquisition order. For example, in Chiapas where the incidence of extreme poverty is the highest, the poor are those that do not have a radio, a refrigerator, a washing machine, a car, a phone, a computer and a hot water heater. Thus, the main merit of an asset approach based on idea of an order of acquisition is that the value of the index provides us with a clear list of the goods and services that households own or do not own and an intuitive definition of the poverty line.

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## Appendix

### Table A.1 Codes of the various states of Mexico

| State | Code | State | Code |
|---|---|---|---|
| Aguascalientes | AGS | Morelos | MOR |
| Baja California | BCN | Nayarit | NAY |
| Baja California Sur | BCS | Nuevo Leon | NLE |
| Campeche | CAMP | Oaxaca | OAX |
| Coahuila | COA | Puebla | PUE |
| Colima | COL | Queretaro | QRO |
| Chiapas | CHAP | Quintana Roo | ROO |
| Chihuahua | CHI | San Luis Potosi | SLP |
| Distrito Federal | DIF | Sinaloa | SIN |
| Durango | DUR | Sonora | SON |
| Guanajuato | GTO | Tabasco | TAB |
| Guerrero | GRO | Tamaulipas | TAM |
| Hidalgo | HGO | Tlaxcala | TLX |
| Jalisco | JAL | Veracruz | VER |
| Mexico | MEX | Yucatan | YUC |
| Michoacan | MIC | Zacatecas | ZAC |

Table A-2: Rank correlations between States in 2000, on the basis of the Paroush algorithm

| | AGS | BCN | BCS | CAMP | COA | COL | CHAP | CHI | DIF | DUR | GTO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 1.0000 | 0.9500 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.8833 | 0.9500 | 0.9500 | 0.9667 | 0.9667 | 0.8833 |
| **BCN** | 0.9500 | 1.0000 | 0.9500 | 0.9333 | 0.9833 | 0.9333 | 0.9000 | 0.9333 | 0.9000 | 0.8667 | 0.8667 | 0.8333 |
| **BCS** | 0.9000 | 0.9500 | 1.0000 | 0.9500 | 0.9667 | 0.9500 | 0.9333 | 0.9000 | 0.8500 | 0.8333 | 0.8333 | 0.8833 |
| **CAMP** | 0.9167 | 0.9333 | 0.9500 | 1.0000 | 0.9500 | 1.0000 | 0.9833 | 0.9167 | 0.9000 | 0.8333 | 0.9000 | 0.9333 |
| **COA** | 0.9667 | 0.9833 | 0.9667 | 0.9500 | 1.0000 | 0.9500 | 0.9333 | 0.9667 | 0.9167 | 0.9000 | 0.9000 | 0.8833 |
| **COL** | 0.9167 | 0.9333 | 0.9500 | 1.0000 | 0.9500 | 1.0000 | 0.9833 | 0.9167 | 0.9000 | 0.8333 | 0.9000 | 0.9333 |
| **CHAP** | 0.8833 | 0.9000 | 0.9333 | 0.9833 | 0.9333 | 0.9833 | 1.0000 | 0.9333 | 0.8833 | 0.8167 | 0.8833 | 0.9500 |
| **CHI** | 0.9500 | 0.9333 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9333 | 1.0000 | 0.9500 | 0.9167 | 0.9167 | 0.8833 |
| **DIF** | 0.9500 | 0.9000 | 0.8500 | 0.9000 | 0.9167 | 0.9000 | 0.8833 | 0.9500 | 1.0000 | 0.9333 | 0.9333 | 0.8333 |
| **DUR** | 0.9667 | 0.8667 | 0.8333 | 0.8333 | 0.9000 | 0.8333 | 0.8167 | 0.9167 | 0.9333 | 1.0000 | 0.9667 | 0.8667 |
| **GTO** | 0.9667 | 0.8667 | 0.8333 | 0.9000 | 0.9000 | 0.9000 | 0.8833 | 0.9167 | 0.9333 | 0.9667 | 1.0000 | 0.9333 |
| **GRO** | 0.8833 | 0.8333 | 0.8833 | 0.9333 | 0.8833 | 0.9333 | 0.9500 | 0.8833 | 0.8333 | 0.8667 | 0.9333 | 1.0000 |
| **HGO** | 0.9167 | 0.8500 | 0.8333 | 0.8333 | 0.9000 | 0.8333 | 0.8667 | 0.9667 | 0.9333 | 0.9500 | 0.9167 | 0.8667 |
| **JAL** | 0.9833 | 0.9167 | 0.8667 | 0.9333 | 0.9333 | 0.9333 | 0.9000 | 0.9333 | 0.9667 | 0.9500 | 0.9833 | 0.9000 |
| **MEX** | 0.9667 | 0.8667 | 0.8333 | 0.9000 | 0.9000 | 0.9000 | 0.8833 | 0.9167 | 0.9333 | 0.9667 | 1.0000 | 0.9333 |
| **MIC** | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 0.9833 | 0.9333 | 0.9167 | 0.9833 | 0.9667 | 0.9333 | 0.9333 | 0.8667 |
| **MOR** | 0.9667 | 0.9333 | 0.8833 | 0.9500 | 0.9500 | 0.9500 | 0.9333 | 0.9667 | 0.9833 | 0.9167 | 0.9500 | 0.8833 |
| **NAY** | 0.9333 | 0.9667 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.8833 | 0.8500 | 0.8833 | 0.9167 |
| **NLE** | 0.9333 | 0.9167 | 0.9000 | 0.9833 | 0.9333 | 0.9833 | 0.9667 | 0.9333 | 0.9500 | 0.8667 | 0.9333 | 0.9167 |
| **OAX** | 0.9500 | 0.9333 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9333 | 1.0000 | 0.9500 | 0.9167 | 0.9167 | 0.8833 |
| **PUE** | 0.9167 | 0.8667 | 0.8333 | 0.8833 | 0.9000 | 0.8833 | 0.9000 | 0.9667 | 0.9833 | 0.9167 | 0.9167 | 0.8500 |
| **QRO** | 0.9500 | 0.8667 | 0.8500 | 0.8667 | 0.9167 | 0.8667 | 0.8833 | 0.9500 | 0.9000 | 0.9667 | 0.9667 | 0.9333 |
| **ROO** | 0.9000 | 0.8833 | 0.8833 | 0.9667 | 0.9167 | 0.9667 | 0.9833 | 0.9500 | 0.9333 | 0.8500 | 0.9167 | 0.9333 |
| **SLP** | 0.9500 | 0.9333 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9333 | 1.0000 | 0.9500 | 0.9167 | 0.9167 | 0.8833 |
| **SIN** | 0.9167 | 0.9833 | 0.9667 | 0.9667 | 0.9667 | 0.9667 | 0.9333 | 0.9000 | 0.8667 | 0.8167 | 0.8500 | 0.8667 |
| **SON** | 0.9500 | 1.0000 | 0.9500 | 0.9333 | 0.9833 | 0.9333 | 0.9000 | 0.9333 | 0.9000 | 0.8667 | 0.8667 | 0.8333 |
| **TAB** | 0.9167 | 0.9333 | 0.9500 | 1.0000 | 0.9500 | 1.0000 | 0.9833 | 0.9167 | 0.9000 | 0.8333 | 0.9000 | 0.9333 |
| **TAM** | 0.9333 | 0.9667 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.8833 | 0.8500 | 0.8833 | 0.9167 |
| **TLX** | 0.9333 | 0.8333 | 0.8167 | 0.8167 | 0.8833 | 0.8167 | 0.8333 | 0.9333 | 0.9167 | 0.9833 | 0.9500 | 0.8833 |
| **VER** | 0.9000 | 0.8833 | 0.8833 | 0.9667 | 0.9167 | 0.9667 | 0.9833 | 0.9500 | 0.9333 | 0.8500 | 0.9167 | 0.9333 |
| **YUC** | 0.9167 | 0.8667 | 0.9000 | 0.9500 | 0.9000 | 0.9500 | 0.9333 | 0.8667 | 0.8500 | 0.8833 | 0.9500 | 0.9833 |
| **ZAC** | 0.9833 | 0.9000 | 0.8667 | 0.8833 | 0.9333 | 0.8833 | 0.8667 | 0.9333 | 0.9167 | 0.9833 | 0.9833 | 0.9167 |

Table A-2 (cont.)

| | MOR | NAY | NLE | OAX | PUE | QRO | ROO | SLP | SIN | SON | TAB | TAM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 0.9667 | 0.9333 | 0.9333 | 0.9500 | 0.9167 | 0.9500 | 0.9000 | 0.9500 | 0.9167 | 0.9500 | 0.9167 | 0.9333 |
| **BCN** | 0.9333 | 0.9667 | 0.9167 | 0.9333 | 0.8667 | 0.8667 | 0.8833 | 0.9333 | 0.9833 | 1.0000 | 0.9333 | 0.9667 |
| **BCS** | 0.8833 | 0.9833 | 0.9000 | 0.9000 | 0.8333 | 0.8500 | 0.8833 | 0.9000 | 0.9667 | 0.9500 | 0.9500 | 0.9833 |
| **CAMP** | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.8833 | 0.8667 | 0.9667 | 0.9167 | 0.9667 | 0.9333 | 1.0000 | 0.9833 |
| **COA** | 0.9500 | 0.9833 | 0.9333 | 0.9667 | 0.9000 | 0.9167 | 0.9167 | 0.9667 | 0.9667 | 0.9833 | 0.9500 | 0.9833 |
| **COL** | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.8833 | 0.8667 | 0.9667 | 0.9167 | 0.9667 | 0.9333 | 1.0000 | 0.9833 |
| **CHAP** | 0.9333 | 0.9667 | 0.9667 | 0.9333 | 0.9000 | 0.8833 | 0.9833 | 0.9333 | 0.9333 | 0.9000 | 0.9833 | 0.9667 |
| **CHI** | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9667 | 0.9500 | 0.9500 | 1.0000 | 0.9000 | 0.9333 | 0.9167 | 0.9333 |
| **DIF** | 0.9833 | 0.8833 | 0.9500 | 0.9500 | 0.9833 | 0.9000 | 0.9333 | 0.9500 | 0.8667 | 0.9000 | 0.9000 | 0.8833 |
| **DUR** | 0.9167 | 0.8500 | 0.8667 | 0.9167 | 0.9167 | 0.9667 | 0.8500 | 0.9167 | 0.8167 | 0.8667 | 0.8333 | 0.8500 |
| **GTO** | 0.9500 | 0.8833 | 0.9333 | 0.9167 | 0.9167 | 0.9667 | 0.9167 | 0.9167 | 0.8500 | 0.8667 | 0.9000 | 0.8833 |
| **GRO** | 0.8833 | 0.9167 | 0.9167 | 0.8833 | 0.8500 | 0.9333 | 0.9333 | 0.8833 | 0.8667 | 0.8333 | 0.9333 | 0.9167 |
| **HGO** | 0.9167 | 0.8500 | 0.8667 | 0.9667 | 0.9667 | 0.9667 | 0.9000 | 0.9667 | 0.8000 | 0.8500 | 0.8333 | 0.8500 |
| **JAL** | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9333 | 0.9333 | 0.9333 | 0.9333 | 0.9000 | 0.9167 | 0.9333 | 0.9167 |
| **MEX** | 0.9500 | 0.8833 | 0.9333 | 0.9167 | 0.9167 | 0.9667 | 0.9167 | 0.9167 | 0.8500 | 0.8667 | 0.9000 | 0.8833 |
| **MIC** | 0.9833 | 0.9500 | 0.9500 | 0.9833 | 0.9500 | 0.9333 | 0.9333 | 0.9833 | 0.9333 | 0.9667 | 0.9333 | 0.9500 |
| **MOR** | 1.0000 | 0.9333 | 0.9833 | 0.9667 | 0.9667 | 0.9167 | 0.9667 | 0.9667 | 0.9167 | 0.9333 | 0.9500 | 0.9333 |
| **NAY** | 0.9333 | 1.0000 | 0.9500 | 0.9333 | 0.8667 | 0.8833 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9833 | 1.0000 |
| **NLE** | 0.9833 | 0.9500 | 1.0000 | 0.9333 | 0.9333 | 0.8833 | 0.9833 | 0.9333 | 0.9333 | 0.9167 | 0.9833 | 0.9500 |
| **OAX** | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9667 | 0.9500 | 0.9500 | 1.0000 | 0.9000 | 0.9333 | 0.9167 | 0.9333 |
| **PUE** | 0.9667 | 0.8667 | 0.9333 | 0.9667 | 1.0000 | 0.9167 | 0.9500 | 0.9667 | 0.8333 | 0.8667 | 0.8833 | 0.8667 |
| **QRO** | 0.9167 | 0.8833 | 0.8833 | 0.9500 | 0.9167 | 1.0000 | 0.9000 | 0.9500 | 0.8333 | 0.8667 | 0.8667 | 0.8833 |
| **ROO** | 0.9667 | 0.9333 | 0.9833 | 0.9500 | 0.9500 | 0.9000 | 1.0000 | 0.9500 | 0.9000 | 0.8833 | 0.9667 | 0.9333 |
| **SLP** | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9667 | 0.9500 | 0.9500 | 1.0000 | 0.9000 | 0.9333 | 0.9167 | 0.9333 |
| **SIN** | 0.9167 | 0.9833 | 0.9333 | 0.9000 | 0.8333 | 0.8333 | 0.9000 | 0.9000 | 1.0000 | 0.9833 | 0.9667 | 0.9833 |
| **SON** | 0.9333 | 0.9667 | 0.9167 | 0.9333 | 0.8667 | 0.8667 | 0.8833 | 0.9333 | 0.9833 | 1.0000 | 0.9333 | 0.9667 |
| **TAB** | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.8833 | 0.8667 | 0.9667 | 0.9167 | 0.9667 | 0.9333 | 1.0000 | 0.9833 |
| **TAM** | 0.9333 | 1.0000 | 0.9500 | 0.9333 | 0.8667 | 0.8833 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9833 | 1.0000 |
| **TLX** | 0.9000 | 0.8333 | 0.8500 | 0.9333 | 0.9333 | 0.9833 | 0.8667 | 0.9333 | 0.7833 | 0.8333 | 0.8167 | 0.8333 |
| **VER** | 0.9667 | 0.9333 | 0.9833 | 0.9500 | 0.9500 | 0.9000 | 1.0000 | 0.9500 | 0.9000 | 0.8833 | 0.9667 | 0.9333 |
| **YUC** | 0.9000 | 0.9333 | 0.9333 | 0.8667 | 0.8333 | 0.9167 | 0.9167 | 0.8667 | 0.9000 | 0.8667 | 0.9500 | 0.9333 |
| **ZAC** | 0.9333 | 0.9000 | 0.9000 | 0.9333 | 0.9000 | 0.9833 | 0.8833 | 0.9333 | 0.8667 | 0.9000 | 0.8833 | 0.9000 |

Table A-3: Rank correlations between States in 2010, on the basis of the Paroush algorithm

| | AGS | BCN | BCS | CAMP | COA | COL | CHAP | CHI | DIF | DUR | GTO | GRO | HGO | JAL | MEX | MIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 1.0000 | 0.9667 | 0.9167 | 0.8500 | 0.9667 | 0.9333 | 0.8667 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.8667 | 0.9500 | 0.9667 | 0.9667 | 0.9667 |
| **BCN** | 0.9667 | 1.0000 | 0.9667 | 0.9167 | 1.0000 | 0.9833 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 1.0000 | 0.9167 | 1.0000 |
| **BCS** | 0.9167 | 0.9667 | 1.0000 | 0.9000 | 0.9667 | 0.9333 | 0.9000 | 0.9333 | 0.8000 | 0.9333 | 0.9167 | 0.8500 | 0.9000 | 0.9667 | 0.8333 | 0.9667 |
| **CAMP** | 0.8500 | 0.9167 | 0.9000 | 1.0000 | 0.9167 | 0.9333 | 0.9333 | 0.8667 | 0.7833 | 0.8667 | 0.8500 | 0.9333 | 0.7500 | 0.9167 | 0.7833 | 0.9167 |
| **COA** | 0.9667 | 1.0000 | 0.9667 | 0.9167 | 1.0000 | 0.9833 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 1.0000 | 0.9167 | 1.0000 |
| **COL** | 0.9333 | 0.9833 | 0.9333 | 0.9333 | 0.9833 | 1.0000 | 0.9667 | 0.9500 | 0.8667 | 0.9500 | 0.9333 | 0.9667 | 0.8833 | 0.9833 | 0.9000 | 0.9833 |
| **CHAP** | 0.8667 | 0.9333 | 0.9000 | 0.9333 | 0.9333 | 0.9667 | 1.0000 | 0.8833 | 0.8500 | 0.8833 | 0.8667 | 0.9667 | 0.8333 | 0.9333 | 0.8667 | 0.9333 |
| **CHI** | 0.9833 | 0.9833 | 0.9333 | 0.8667 | 0.9833 | 0.9500 | 0.8833 | 1.0000 | 0.9333 | 1.0000 | 0.9833 | 0.8833 | 0.9667 | 0.9833 | 0.9500 | 0.9833 |
| **DIF** | 0.9167 | 0.8833 | 0.8000 | 0.7833 | 0.8833 | 0.8667 | 0.8500 | 0.9333 | 1.0000 | 0.9333 | 0.9167 | 0.8667 | 0.9333 | 0.8833 | 0.9667 | 0.8833 |
| **DUR** | 0.9833 | 0.9833 | 0.9333 | 0.8667 | 0.9833 | 0.9500 | 0.8833 | 1.0000 | 0.9333 | 1.0000 | 0.9833 | 0.8833 | 0.9667 | 0.9833 | 0.9500 | 0.9833 |
| **GTO** | 1.0000 | 0.9667 | 0.9167 | 0.8500 | 0.9667 | 0.9333 | 0.8667 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.8667 | 0.9500 | 0.9667 | 0.9667 | 0.9667 |
| **GRO** | 0.8667 | 0.9167 | 0.8500 | 0.9333 | 0.9167 | 0.9667 | 0.9667 | 0.8833 | 0.8667 | 0.8833 | 0.8667 | 1.0000 | 0.8000 | 0.9167 | 0.8667 | 0.9167 |
| **HGO** | 0.9500 | 0.9333 | 0.9000 | 0.7500 | 0.9333 | 0.8833 | 0.8333 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.8000 | 1.0000 | 0.9333 | 0.9500 | 0.9333 |
| **JAL** | 0.9667 | 1.0000 | 0.9667 | 0.9167 | 1.0000 | 0.9833 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 1.0000 | 0.9167 | 1.0000 |
| **MEX** | 0.9667 | 0.9167 | 0.8333 | 0.7833 | 0.9167 | 0.9000 | 0.8667 | 0.9500 | 0.9667 | 0.9500 | 0.9667 | 0.8667 | 0.9500 | 0.9167 | 1.0000 | 0.9167 |
| **MIC** | 0.9667 | 1.0000 | 0.9667 | 0.9167 | 1.0000 | 0.9833 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 1.0000 | 0.9167 | 1.0000 |
| **MOR** | 0.9333 | 0.9333 | 0.8333 | 0.8500 | 0.9333 | 0.9500 | 0.9000 | 0.9500 | 0.9500 | 0.9500 | 0.9333 | 0.9500 | 0.9000 | 0.9333 | 0.9500 | 0.9333 |
| **NAY** | 0.9333 | 0.9833 | 0.9333 | 0.9333 | 0.9833 | 1.0000 | 0.9667 | 0.9500 | 0.8667 | 0.9500 | 0.9333 | 0.9667 | 0.8833 | 0.9833 | 0.9000 | 0.9833 |
| **NLE** | 0.9500 | 0.9833 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9000 | 0.9667 | 0.8500 | 0.9667 | 0.9500 | 0.9000 | 0.8833 | 0.9833 | 0.8833 | 0.9833 |
| **OAX** | 0.9167 | 0.9667 | 0.9167 | 0.9000 | 0.9667 | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.9333 | 0.9167 | 0.9500 | 0.9000 | 0.9667 | 0.9167 | 0.9667 |
| **PUE** | 0.9500 | 0.9333 | 0.8500 | 0.8000 | 0.9333 | 0.9167 | 0.8833 | 0.9667 | 0.9833 | 0.9667 | 0.9500 | 0.8833 | 0.9667 | 0.9333 | 0.9833 | 0.9333 |
| **QRO** | 0.9833 | 0.9833 | 0.9500 | 0.9000 | 0.9833 | 0.9667 | 0.9167 | 0.9667 | 0.8667 | 0.9667 | 0.9833 | 0.9000 | 0.9167 | 0.9833 | 0.9333 | 0.9833 |
| **ROO** | 0.8500 | 0.9167 | 0.9000 | 1.0000 | 0.9167 | 0.9333 | 0.9333 | 0.8667 | 0.7833 | 0.8667 | 0.8500 | 0.9333 | 0.7500 | 0.9167 | 0.7833 | 0.9167 |
| **SLP** | 0.9500 | 0.9833 | 0.9500 | 0.8833 | 0.9833 | 0.9667 | 0.9500 | 0.9667 | 0.9000 | 0.9667 | 0.9500 | 0.9000 | 0.9500 | 0.9833 | 0.9333 | 0.9833 |
| **SIN** | 0.8833 | 0.9167 | 0.8667 | 0.9667 | 0.9167 | 0.9500 | 0.9333 | 0.8667 | 0.7833 | 0.8667 | 0.8833 | 0.9500 | 0.7500 | 0.9167 | 0.8333 | 0.9167 |
| **SON** | 0.9500 | 0.9833 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9000 | 0.9667 | 0.8500 | 0.9667 | 0.9500 | 0.9000 | 0.8833 | 0.9833 | 0.8833 | 0.9833 |
| **TAB** | 0.8500 | 0.9167 | 0.9000 | 1.0000 | 0.9167 | 0.9333 | 0.9333 | 0.8667 | 0.7833 | 0.8667 | 0.8500 | 0.9333 | 0.7500 | 0.9167 | 0.7833 | 0.9167 |
| **TAM** | 0.9167 | 0.9667 | 0.9000 | 0.9500 | 0.9667 | 0.9833 | 0.9333 | 0.9333 | 0.8333 | 0.9333 | 0.9167 | 0.9500 | 0.8333 | 0.9667 | 0.8667 | 0.9667 |
| **TLX** | 0.9500 | 0.9333 | 0.9000 | 0.7500 | 0.9333 | 0.8833 | 0.8333 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.8000 | 1.0000 | 0.9333 | 0.9500 | 0.9333 |
| **VER** | 0.9167 | 0.9667 | 0.9167 | 0.9000 | 0.9667 | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.9333 | 0.9167 | 0.9500 | 0.9000 | 0.9667 | 0.9167 | 0.9667 |
| **YUC** | 0.8833 | 0.9167 | 0.8833 | 0.9167 | 0.9167 | 0.9500 | 0.9833 | 0.8667 | 0.8333 | 0.8667 | 0.8833 | 0.9500 | 0.8167 | 0.9167 | 0.8833 | 0.9167 |
| **ZAC** | 1.0000 | 0.9667 | 0.9167 | 0.8500 | 0.9667 | 0.9333 | 0.8667 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.8667 | 0.9500 | 0.9667 | 0.9667 | 0.9667 |

Table A-3 (cont.)

| | MOR | NAY | NLE | OAX | PUE | QRO | ROO | SLP | SIN | SON | TAB | TAM | TLX | VER | YUC | ZAC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 0.9333 | 0.9333 | 0.9500 | 0.9167 | 0.9500 | 0.9833 | 0.8500 | 0.9500 | 0.8833 | 0.9500 | 0.8500 | 0.9167 | 0.9500 | 0.9167 | 0.8833 | 1.0000 |
| **BCN** | 0.9333 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9667 |
| **BCS** | 0.8333 | 0.9333 | 0.9333 | 0.9167 | 0.8500 | 0.9500 | 0.9000 | 0.9500 | 0.8667 | 0.9333 | 0.9000 | 0.9000 | 0.9000 | 0.9167 | 0.8833 | 0.9167 |
| **CAMP** | 0.8500 | 0.9333 | 0.9333 | 0.9000 | 0.8000 | 0.9000 | 1.0000 | 0.8833 | 0.9667 | 0.9333 | 1.0000 | 0.9500 | 0.7500 | 0.9000 | 0.9167 | 0.8500 |
| **COA** | 0.9333 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9667 |
| **COL** | 0.9500 | 1.0000 | 0.9667 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.9667 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9500 | 0.9333 |
| **CHAP** | 0.9000 | 0.9667 | 0.9000 | 0.9833 | 0.8833 | 0.9167 | 0.9333 | 0.9500 | 0.9333 | 0.9000 | 0.9333 | 0.9333 | 0.8333 | 0.9833 | 0.9833 | 0.8667 |
| **CHI** | 0.9500 | 0.9500 | 0.9667 | 0.9333 | 0.9667 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9333 | 0.9667 | 0.9333 | 0.8667 | 0.9833 |
| **DIF** | 0.9500 | 0.8667 | 0.8500 | 0.8833 | 0.9833 | 0.8667 | 0.7833 | 0.9000 | 0.7833 | 0.8500 | 0.7833 | 0.8333 | 0.9333 | 0.8833 | 0.8333 | 0.9167 |
| **DUR** | 0.9500 | 0.9500 | 0.9667 | 0.9333 | 0.9667 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9333 | 0.9667 | 0.9333 | 0.8667 | 0.9833 |
| **GTO** | 0.9333 | 0.9333 | 0.9500 | 0.9167 | 0.9500 | 0.9833 | 0.8500 | 0.9500 | 0.8833 | 0.9500 | 0.8500 | 0.9167 | 0.9500 | 0.9167 | 0.8833 | 1.0000 |
| **GRO** | 0.9500 | 0.9667 | 0.9000 | 0.9500 | 0.8833 | 0.9000 | 0.9333 | 0.9000 | 0.9500 | 0.9000 | 0.9333 | 0.9500 | 0.8000 | 0.9500 | 0.9500 | 0.8667 |
| **HGO** | 0.9000 | 0.8833 | 0.8833 | 0.9000 | 0.9667 | 0.9167 | 0.7500 | 0.9500 | 0.7500 | 0.8833 | 0.7500 | 0.8333 | 1.0000 | 0.9000 | 0.8167 | 0.9500 |
| **JAL** | 0.9333 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9667 |
| **MEX** | 0.9500 | 0.9000 | 0.8833 | 0.9167 | 0.9833 | 0.9333 | 0.7833 | 0.9333 | 0.8333 | 0.8833 | 0.7833 | 0.8667 | 0.9500 | 0.9167 | 0.8833 | 0.9667 |
| **MIC** | 0.9333 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9667 |
| **MOR** | 1.0000 | 0.9500 | 0.9167 | 0.9333 | 0.9667 | 0.9167 | 0.8500 | 0.9167 | 0.8833 | 0.9167 | 0.8500 | 0.9333 | 0.9000 | 0.9333 | 0.8833 | 0.9333 |
| **NAY** | 0.9500 | 1.0000 | 0.9667 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.9667 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9500 | 0.9333 |
| **NLE** | 0.9167 | 0.9667 | 1.0000 | 0.9333 | 0.9000 | 0.9667 | 0.9333 | 0.9500 | 0.9333 | 1.0000 | 0.9333 | 0.9833 | 0.8833 | 0.9333 | 0.8833 | 0.9500 |
| **OAX** | 0.9333 | 0.9833 | 0.9333 | 1.0000 | 0.9333 | 0.9500 | 0.9000 | 0.9833 | 0.9167 | 0.9333 | 0.9000 | 0.9500 | 0.9000 | 1.0000 | 0.9667 | 0.9167 |
| **PUE** | 0.9667 | 0.9167 | 0.9000 | 0.9333 | 1.0000 | 0.9167 | 0.8000 | 0.9500 | 0.8167 | 0.9000 | 0.8000 | 0.8833 | 0.9667 | 0.9333 | 0.8667 | 0.9500 |
| **QRO** | 0.9167 | 0.9667 | 0.9667 | 0.9500 | 0.9167 | 1.0000 | 0.9000 | 0.9667 | 0.9333 | 0.9667 | 0.9000 | 0.9500 | 0.9167 | 0.9500 | 0.9333 | 0.9833 |
| **ROO** | 0.8500 | 0.9333 | 0.9333 | 0.9000 | 0.8000 | 0.9000 | 1.0000 | 0.8833 | 0.9667 | 0.9333 | 1.0000 | 0.9500 | 0.7500 | 0.9000 | 0.9167 | 0.8500 |
| **SLP** | 0.9167 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 0.9667 | 0.8833 | 1.0000 | 0.8833 | 0.9500 | 0.8833 | 0.9333 | 0.9500 | 0.9833 | 0.9333 | 0.9500 |
| **SIN** | 0.8833 | 0.9500 | 0.9333 | 0.9167 | 0.8167 | 0.9333 | 0.9667 | 0.8833 | 1.0000 | 0.9333 | 0.9667 | 0.9667 | 0.7500 | 0.9167 | 0.9500 | 0.8833 |
| **SON** | 0.9167 | 0.9667 | 1.0000 | 0.9333 | 0.9000 | 0.9667 | 0.9333 | 0.9500 | 0.9333 | 1.0000 | 0.9333 | 0.9833 | 0.8833 | 0.9333 | 0.8833 | 0.9500 |
| **TAB** | 0.8500 | 0.9333 | 0.9333 | 0.9000 | 0.8000 | 0.9000 | 1.0000 | 0.8833 | 0.9667 | 0.9333 | 1.0000 | 0.9500 | 0.7500 | 0.9000 | 0.9167 | 0.8500 |
| **TAM** | 0.9333 | 0.9833 | 0.9833 | 0.9500 | 0.8833 | 0.9500 | 0.9500 | 0.9333 | 0.9667 | 0.9833 | 0.9500 | 1.0000 | 0.8333 | 0.9500 | 0.9167 | 0.9167 |
| **TLX** | 0.9000 | 0.8833 | 0.8833 | 0.9000 | 0.9667 | 0.9167 | 0.7500 | 0.9500 | 0.7500 | 0.8833 | 0.7500 | 0.8333 | 1.0000 | 0.9000 | 0.8167 | 0.9500 |
| **VER** | 0.9333 | 0.9833 | 0.9333 | 1.0000 | 0.9333 | 0.9500 | 0.9000 | 0.9833 | 0.9167 | 0.9333 | 0.9000 | 0.9500 | 0.9000 | 1.0000 | 0.9667 | 0.9167 |
| **YUC** | 0.8833 | 0.9500 | 0.8833 | 0.9667 | 0.8667 | 0.9333 | 0.9167 | 0.9333 | 0.9500 | 0.8833 | 0.9167 | 0.9167 | 0.8167 | 0.9667 | 1.0000 | 0.8833 |
| **ZAC** | 0.9333 | 0.9333 | 0.9500 | 0.9167 | 0.9500 | 0.9833 | 0.8500 | 0.9500 | 0.8833 | 0.9500 | 0.8500 | 0.9167 | 0.9500 | 0.9167 | 0.8833 | 1.0000 |

Table A-4: Rank correlations between the States in 2000, on the basis of Item Response Theory

| | AGS | BCN | BCS | CAMP | COA | COL | CHAP | CHI | DIF | DUR | GTO | GRO | HGO | JAL | MEX | MIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 1.0000 | 0.9167 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9000 | 0.9500 | 0.9500 | 0.9667 | 0.9833 | 0.8833 | 0.9167 | 1.0000 | 0.9667 | 0.9833 |
| **BCN** | 0.9167 | 1.0000 | 0.9667 | 0.9667 | 0.9667 | 0.9667 | 0.9500 | 0.9000 | 0.8667 | 0.8167 | 0.8667 | 0.8667 | 0.8000 | 0.9167 | 0.8500 | 0.9333 |
| **BCS** | 0.9000 | 0.9667 | 1.0000 | 0.9500 | 0.9667 | 0.9500 | 0.9667 | 0.9000 | 0.8500 | 0.8333 | 0.8667 | 0.8833 | 0.8333 | 0.9000 | 0.8333 | 0.9167 |
| **CAMP** | 0.9167 | 0.9667 | 0.9500 | 1.0000 | 0.9500 | 1.0000 | 0.9667 | 0.9167 | 0.9000 | 0.8333 | 0.8833 | 0.9333 | 0.8333 | 0.9167 | 0.9000 | 0.9333 |
| **COA** | 0.9667 | 0.9667 | 0.9667 | 0.9500 | 1.0000 | 0.9500 | 0.9667 | 0.9667 | 0.9167 | 0.9000 | 0.9333 | 0.8833 | 0.9000 | 0.9667 | 0.9000 | 0.9833 |
| **COL** | 0.9167 | 0.9667 | 0.9500 | 1.0000 | 0.9500 | 1.0000 | 0.9667 | 0.9167 | 0.9000 | 0.8333 | 0.8833 | 0.9333 | 0.8333 | 0.9167 | 0.9000 | 0.9333 |
| **CHAP** | 0.9000 | 0.9500 | 0.9667 | 0.9667 | 0.9667 | 0.9667 | 1.0000 | 0.9500 | 0.8667 | 0.8333 | 0.8833 | 0.9333 | 0.8833 | 0.9000 | 0.8667 | 0.9333 |
| **CHI** | 0.9500 | 0.9000 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9500 | 1.0000 | 0.9500 | 0.9167 | 0.9333 | 0.8833 | 0.9667 | 0.9500 | 0.9167 | 0.9833 |
| **DIF** | 0.9500 | 0.8667 | 0.8500 | 0.9000 | 0.9167 | 0.9000 | 0.8667 | 0.9500 | 1.0000 | 0.9333 | 0.9167 | 0.8333 | 0.9333 | 0.9500 | 0.9333 | 0.9667 |
| **DUR** | 0.9667 | 0.8167 | 0.8333 | 0.8333 | 0.9000 | 0.8333 | 0.8333 | 0.9167 | 0.9333 | 1.0000 | 0.9833 | 0.8667 | 0.9500 | 0.9667 | 0.9667 | 0.9333 |
| **GTO** | 0.9833 | 0.8667 | 0.8667 | 0.8833 | 0.9333 | 0.8833 | 0.8833 | 0.9333 | 0.9167 | 0.9833 | 1.0000 | 0.9167 | 0.9333 | 0.9833 | 0.9833 | 0.9500 |
| **GRO** | 0.8833 | 0.8667 | 0.8833 | 0.9333 | 0.8833 | 0.9333 | 0.9333 | 0.8833 | 0.8333 | 0.8667 | 0.9167 | 1.0000 | 0.8667 | 0.8833 | 0.9333 | 0.8667 |
| **HGO** | 0.9167 | 0.8000 | 0.8333 | 0.8333 | 0.9000 | 0.8333 | 0.8833 | 0.9667 | 0.9333 | 0.9500 | 0.9333 | 0.8667 | 1.0000 | 0.9167 | 0.9167 | 0.9333 |
| **JAL** | 1.0000 | 0.9167 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9000 | 0.9500 | 0.9500 | 0.9667 | 0.9833 | 0.8833 | 0.9167 | 1.0000 | 0.9667 | 0.9833 |
| **MEX** | 0.9667 | 0.8500 | 0.8333 | 0.9000 | 0.9000 | 0.9000 | 0.8667 | 0.9167 | 0.9333 | 0.9667 | 0.9833 | 0.9333 | 0.9167 | 0.9667 | 1.0000 | 0.9333 |
| **MIC** | 0.9833 | 0.9333 | 0.9167 | 0.9333 | 0.9833 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9333 | 0.9500 | 0.8667 | 0.9333 | 0.9833 | 0.9333 | 1.0000 |
| **MOR** | 0.9667 | 0.9167 | 0.8833 | 0.9500 | 0.9500 | 0.9500 | 0.9167 | 0.9667 | 0.9833 | 0.9167 | 0.9333 | 0.8833 | 0.9167 | 0.9667 | 0.9500 | 0.9833 |
| **NAY** | 0.9333 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.8500 | 0.9000 | 0.9167 | 0.8500 | 0.9333 | 0.8833 | 0.9500 |
| **NLE** | 0.9333 | 0.9333 | 0.9000 | 0.9833 | 0.9333 | 0.9833 | 0.9333 | 0.9333 | 0.9500 | 0.8667 | 0.9000 | 0.9167 | 0.8667 | 0.9333 | 0.9333 | 0.9500 |
| **OAX** | 0.9500 | 0.9000 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9500 | 1.0000 | 0.9500 | 0.9167 | 0.9333 | 0.8833 | 0.9667 | 0.9500 | 0.9167 | 0.9833 |
| **PUE** | 0.9333 | 0.8500 | 0.8667 | 0.8667 | 0.9333 | 0.8667 | 0.9000 | 0.9833 | 0.9667 | 0.9333 | 0.9167 | 0.8333 | 0.9833 | 0.9333 | 0.9000 | 0.9667 |
| **QRO** | 0.9500 | 0.8333 | 0.8500 | 0.8667 | 0.9167 | 0.8667 | 0.9000 | 0.9500 | 0.9000 | 0.9667 | 0.9833 | 0.9333 | 0.9667 | 0.9500 | 0.9667 | 0.9333 |
| **ROO** | 0.9000 | 0.9000 | 0.8833 | 0.9667 | 0.9167 | 0.9667 | 0.9500 | 0.9500 | 0.9333 | 0.8500 | 0.8833 | 0.9333 | 0.9000 | 0.9000 | 0.9167 | 0.9333 |
| **SLP** | 0.9500 | 0.9000 | 0.9000 | 0.9167 | 0.9667 | 0.9167 | 0.9500 | 1.0000 | 0.9500 | 0.9167 | 0.9333 | 0.8833 | 0.9667 | 0.9500 | 0.9167 | 0.9833 |
| **SIN** | 0.9167 | 1.0000 | 0.9667 | 0.9667 | 0.9667 | 0.9667 | 0.9500 | 0.9000 | 0.8667 | 0.8167 | 0.8667 | 0.8667 | 0.8000 | 0.9167 | 0.8500 | 0.9333 |
| **SON** | 0.9500 | 0.9833 | 0.9500 | 0.9333 | 0.9833 | 0.9333 | 0.9333 | 0.9333 | 0.9000 | 0.8667 | 0.9000 | 0.8333 | 0.8500 | 0.9500 | 0.8667 | 0.9667 |
| **TAB** | 0.9167 | 0.9667 | 0.9500 | 1.0000 | 0.9500 | 1.0000 | 0.9667 | 0.9167 | 0.9000 | 0.8333 | 0.8833 | 0.9333 | 0.8333 | 0.9167 | 0.9000 | 0.9333 |
| **TAM** | 0.9333 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.8500 | 0.9000 | 0.9167 | 0.8500 | 0.9333 | 0.8833 | 0.9500 |
| **TLX** | 0.9333 | 0.7833 | 0.8167 | 0.8167 | 0.8833 | 0.8167 | 0.8500 | 0.9333 | 0.9167 | 0.9833 | 0.9667 | 0.8833 | 0.9833 | 0.9333 | 0.9500 | 0.9167 |
| **VER** | 0.9333 | 0.8833 | 0.8667 | 0.9333 | 0.9333 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9000 | 0.9167 | 0.9000 | 0.9500 | 0.9333 | 0.9333 | 0.9667 |
| **YUC** | 0.9167 | 0.9000 | 0.9000 | 0.9500 | 0.9000 | 0.9500 | 0.9167 | 0.8667 | 0.8500 | 0.8833 | 0.9333 | 0.9833 | 0.8333 | 0.9167 | 0.9500 | 0.8833 |
| **ZAC** | 0.9833 | 0.8667 | 0.8667 | 0.8833 | 0.9333 | 0.8833 | 0.8833 | 0.9333 | 0.9167 | 0.9833 | 1.0000 | 0.9167 | 0.9333 | 0.9833 | 0.9833 | 0.9500 |

Table A-4 (cont.)

| | MOR | NAY | NLE | OAX | PUE | QRO | ROO | SLP | SIN | SON | TAB | TAM | TLX | VER | YUC | ZAC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 0.9667 | 0.9333 | 0.9333 | 0.9500 | 0.9333 | 0.9500 | 0.9000 | 0.9500 | 0.9167 | 0.9500 | 0.9167 | 0.9333 | 0.9333 | 0.9333 | 0.9167 | 0.9833 |
| **BCN** | 0.9167 | 0.9833 | 0.9333 | 0.9000 | 0.8500 | 0.8333 | 0.9000 | 0.9000 | 1.0000 | 0.9833 | 0.9667 | 0.9833 | 0.7833 | 0.8833 | 0.9000 | 0.8667 |
| **BCS** | 0.8833 | 0.9833 | 0.9000 | 0.9000 | 0.8667 | 0.8500 | 0.8833 | 0.9000 | 0.9667 | 0.9500 | 0.9500 | 0.9833 | 0.8167 | 0.8667 | 0.9000 | 0.8667 |
| **CAMP** | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.8667 | 0.8667 | 0.9667 | 0.9167 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.8167 | 0.9333 | 0.9500 | 0.8833 |
| **COA** | 0.9500 | 0.9833 | 0.9333 | 0.9667 | 0.9333 | 0.9167 | 0.9167 | 0.9667 | 0.9667 | 0.9833 | 0.9500 | 0.9833 | 0.8833 | 0.9333 | 0.9000 | 0.9333 |
| **COL** | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.8667 | 0.8667 | 0.9667 | 0.9167 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.8167 | 0.9333 | 0.9500 | 0.8833 |
| **CHAP** | 0.9167 | 0.9833 | 0.9333 | 0.9500 | 0.9000 | 0.9000 | 0.9500 | 0.9500 | 0.9500 | 0.9333 | 0.9667 | 0.9833 | 0.8500 | 0.9333 | 0.9167 | 0.8833 |
| **CHI** | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9500 | 0.9500 | 1.0000 | 0.9000 | 0.9333 | 0.9167 | 0.9333 | 0.9333 | 0.9833 | 0.8667 | 0.9333 |
| **DIF** | 0.9833 | 0.8833 | 0.9500 | 0.9500 | 0.9667 | 0.9000 | 0.9333 | 0.9500 | 0.8667 | 0.9000 | 0.9000 | 0.8833 | 0.9167 | 0.9667 | 0.8500 | 0.9167 |
| **DUR** | 0.9167 | 0.8500 | 0.8667 | 0.9167 | 0.9333 | 0.9667 | 0.8500 | 0.9167 | 0.8167 | 0.8667 | 0.8333 | 0.8500 | 0.9833 | 0.9000 | 0.8833 | 0.9833 |
| **GTO** | 0.9333 | 0.9000 | 0.9000 | 0.9333 | 0.9167 | 0.9833 | 0.8833 | 0.9333 | 0.8667 | 0.9000 | 0.8833 | 0.9000 | 0.9667 | 0.9167 | 0.9333 | 1.0000 |
| **GRO** | 0.8833 | 0.9167 | 0.9167 | 0.8833 | 0.8333 | 0.9333 | 0.9333 | 0.8833 | 0.8667 | 0.8333 | 0.9333 | 0.9167 | 0.8833 | 0.9000 | 0.9833 | 0.9167 |
| **HGO** | 0.9167 | 0.8500 | 0.8667 | 0.9667 | 0.9833 | 0.9667 | 0.9000 | 0.9667 | 0.8000 | 0.8500 | 0.8333 | 0.8500 | 0.9833 | 0.9500 | 0.8333 | 0.9333 |
| **JAL** | 0.9667 | 0.9333 | 0.9333 | 0.9500 | 0.9333 | 0.9500 | 0.9000 | 0.9500 | 0.9167 | 0.9500 | 0.9167 | 0.9333 | 0.9333 | 0.9333 | 0.9167 | 0.9833 |
| **MEX** | 0.9500 | 0.8833 | 0.9333 | 0.9167 | 0.9000 | 0.9667 | 0.9167 | 0.9167 | 0.8500 | 0.8667 | 0.9000 | 0.8833 | 0.9500 | 0.9333 | 0.9500 | 0.9833 |
| **MIC** | 0.9833 | 0.9500 | 0.9500 | 0.9833 | 0.9667 | 0.9333 | 0.9333 | 0.9833 | 0.9333 | 0.9667 | 0.9333 | 0.9500 | 0.9167 | 0.9667 | 0.8833 | 0.9500 |
| **MOR** | 1.0000 | 0.9333 | 0.9833 | 0.9667 | 0.9500 | 0.9167 | 0.9667 | 0.9667 | 0.9167 | 0.9333 | 0.9500 | 0.9333 | 0.9000 | 0.9833 | 0.9000 | 0.9333 |
| **NAY** | 0.9333 | 1.0000 | 0.9500 | 0.9333 | 0.8833 | 0.8833 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9833 | 1.0000 | 0.8333 | 0.9167 | 0.9333 | 0.9000 |
| **NLE** | 0.9833 | 0.9500 | 1.0000 | 0.9333 | 0.9000 | 0.8833 | 0.9833 | 0.9333 | 0.9333 | 0.9167 | 0.9833 | 0.9500 | 0.8500 | 0.9667 | 0.9333 | 0.9000 |
| **OAX** | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9500 | 0.9500 | 1.0000 | 0.9000 | 0.9333 | 0.9167 | 0.9333 | 0.9333 | 0.9833 | 0.8667 | 0.9333 |
| **PUE** | 0.9500 | 0.8833 | 0.9000 | 0.9833 | 1.0000 | 0.9333 | 0.9167 | 0.9833 | 0.8500 | 0.9000 | 0.8667 | 0.8833 | 0.9500 | 0.9667 | 0.8167 | 0.9167 |
| **QRO** | 0.9167 | 0.8833 | 0.8833 | 0.9500 | 0.9333 | 1.0000 | 0.9000 | 0.9500 | 0.8333 | 0.8667 | 0.8667 | 0.8833 | 0.9833 | 0.9333 | 0.9167 | 0.9833 |
| **ROO** | 0.9667 | 0.9333 | 0.9833 | 0.9500 | 0.9167 | 0.9000 | 1.0000 | 0.9500 | 0.9000 | 0.8833 | 0.9667 | 0.9333 | 0.8667 | 0.9833 | 0.9167 | 0.8833 |
| **SLP** | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9500 | 0.9500 | 1.0000 | 0.9000 | 0.9333 | 0.9167 | 0.9333 | 0.9333 | 0.9833 | 0.8667 | 0.9333 |
| **SIN** | 0.9167 | 0.9833 | 0.9333 | 0.9000 | 0.8500 | 0.8333 | 0.9000 | 0.9000 | 1.0000 | 0.9833 | 0.9667 | 0.9833 | 0.7833 | 0.8833 | 0.9000 | 0.8667 |
| **SON** | 0.9333 | 0.9667 | 0.9167 | 0.9333 | 0.9000 | 0.8667 | 0.8833 | 0.9333 | 0.9833 | 1.0000 | 0.9333 | 0.9667 | 0.8333 | 0.9000 | 0.8667 | 0.9000 |
| **TAB** | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.8667 | 0.8667 | 0.9667 | 0.9167 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.8167 | 0.9333 | 0.9500 | 0.8833 |
| **TAM** | 0.9333 | 1.0000 | 0.9500 | 0.9333 | 0.8833 | 0.8833 | 0.9333 | 0.9333 | 0.9833 | 0.9667 | 0.9833 | 1.0000 | 0.8333 | 0.9167 | 0.9333 | 0.9000 |
| **TLX** | 0.9000 | 0.8333 | 0.8500 | 0.9333 | 0.9500 | 0.9833 | 0.8667 | 0.9333 | 0.7833 | 0.8333 | 0.8167 | 0.8333 | 1.0000 | 0.9167 | 0.8667 | 0.9667 |
| **VER** | 0.9833 | 0.9167 | 0.9667 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9833 | 0.8833 | 0.9000 | 0.9333 | 0.9167 | 0.9167 | 1.0000 | 0.8833 | 0.9167 |
| **YUC** | 0.9000 | 0.9333 | 0.9333 | 0.8667 | 0.8167 | 0.9167 | 0.9167 | 0.8667 | 0.9000 | 0.8667 | 0.9500 | 0.9333 | 0.8667 | 0.8833 | 1.0000 | 0.9333 |
| **ZAC** | 0.9333 | 0.9000 | 0.9000 | 0.9333 | 0.9167 | 0.9833 | 0.8833 | 0.9333 | 0.8667 | 0.9000 | 0.8833 | 0.9000 | 0.9667 | 0.9167 | 0.9333 | 1.0000 |

Table A-5: Rank correlations between the States in 2010, on the basis of Item Response Theory

| | AGS | BCN | BCS | CAMP | COA | COL | CHAP | CHI | DIF | DUR | GTO | GRO | HGO | JAL | MEX | MIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 1.0000 | 0.9667 | 0.9167 | 0.8667 | 0.9667 | 0.9333 | 0.8667 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.8667 | 0.9500 | 0.9833 | 0.9667 | 0.9667 |
| **BCN** | 0.9667 | 1.0000 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 0.9833 | 0.9167 | 1.0000 |
| **BCS** | 0.9167 | 0.9667 | 1.0000 | 0.8833 | 0.9667 | 0.9333 | 0.9000 | 0.9333 | 0.8000 | 0.9333 | 0.9167 | 0.8500 | 0.9000 | 0.9333 | 0.8333 | 0.9667 |
| **CAMP** | 0.8667 | 0.9333 | 0.8833 | 1.0000 | 0.9333 | 0.9667 | 0.9500 | 0.8833 | 0.8000 | 0.8833 | 0.8667 | 0.9667 | 0.7667 | 0.8833 | 0.8167 | 0.9333 |
| **COA** | 0.9667 | 1.0000 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 0.9833 | 0.9167 | 1.0000 |
| **COL** | 0.9333 | 0.9833 | 0.9333 | 0.9667 | 0.9833 | 1.0000 | 0.9667 | 0.9500 | 0.8667 | 0.9500 | 0.9333 | 0.9667 | 0.8833 | 0.9500 | 0.9000 | 0.9833 |
| **CHAP** | 0.8667 | 0.9333 | 0.9000 | 0.9500 | 0.9333 | 0.9667 | 1.0000 | 0.8833 | 0.8500 | 0.8833 | 0.8667 | 0.9667 | 0.8333 | 0.8833 | 0.8667 | 0.9333 |
| **CHI** | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.9833 | 0.9500 | 0.8833 | 1.0000 | 0.9333 | 1.0000 | 0.9833 | 0.8833 | 0.9667 | 1.0000 | 0.9500 | 0.9833 |
| **DIF** | 0.9167 | 0.8833 | 0.8000 | 0.8000 | 0.8833 | 0.8667 | 0.8500 | 0.9333 | 1.0000 | 0.9333 | 0.9167 | 0.8667 | 0.9333 | 0.9333 | 0.9667 | 0.8833 |
| **DUR** | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.9833 | 0.9500 | 0.8833 | 1.0000 | 0.9333 | 1.0000 | 0.9833 | 0.8833 | 0.9667 | 1.0000 | 0.9500 | 0.9833 |
| **GTO** | 1.0000 | 0.9667 | 0.9167 | 0.8667 | 0.9667 | 0.9333 | 0.8667 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.8667 | 0.9500 | 0.9833 | 0.9667 | 0.9667 |
| **GRO** | 0.8667 | 0.9167 | 0.8500 | 0.9667 | 0.9167 | 0.9667 | 0.9667 | 0.8833 | 0.8667 | 0.8833 | 0.8667 | 1.0000 | 0.8000 | 0.8833 | 0.8667 | 0.9167 |
| **HGO** | 0.9500 | 0.9333 | 0.9000 | 0.7667 | 0.9333 | 0.8833 | 0.8333 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.8000 | 1.0000 | 0.9667 | 0.9500 | 0.9333 |
| **JAL** | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.9833 | 0.9500 | 0.8833 | 1.0000 | 0.9333 | 1.0000 | 0.9833 | 0.8833 | 0.9667 | 1.0000 | 0.9500 | 0.9833 |
| **MEX** | 0.9667 | 0.9167 | 0.8333 | 0.8167 | 0.9167 | 0.9000 | 0.8667 | 0.9500 | 0.9667 | 0.9500 | 0.9667 | 0.8667 | 0.9500 | 0.9500 | 1.0000 | 0.9167 |
| **MIC** | 0.9667 | 1.0000 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9333 | 0.9833 | 0.8833 | 0.9833 | 0.9667 | 0.9167 | 0.9333 | 0.9833 | 0.9167 | 1.0000 |
| **MOR** | 0.9333 | 0.9333 | 0.8333 | 0.9000 | 0.9333 | 0.9500 | 0.9000 | 0.9500 | 0.9500 | 0.9500 | 0.9333 | 0.9500 | 0.9000 | 0.9500 | 0.9500 | 0.9333 |
| **NAY** | 0.9333 | 0.9833 | 0.9333 | 0.9667 | 0.9833 | 1.0000 | 0.9667 | 0.9500 | 0.8667 | 0.9500 | 0.9333 | 0.9667 | 0.8833 | 0.9500 | 0.9000 | 0.9833 |
| **NLE** | 0.9500 | 0.9833 | 0.9333 | 0.9500 | 0.9833 | 0.9667 | 0.9000 | 0.9667 | 0.8500 | 0.9667 | 0.9500 | 0.9000 | 0.8833 | 0.9667 | 0.8833 | 0.9833 |
| **OAX** | 0.9167 | 0.9667 | 0.9167 | 0.9333 | 0.9667 | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.9333 | 0.9167 | 0.9500 | 0.9000 | 0.9333 | 0.9167 | 0.9667 |
| **PUE** | 0.9500 | 0.9333 | 0.8500 | 0.8333 | 0.9333 | 0.9167 | 0.8833 | 0.9667 | 0.9833 | 0.9667 | 0.9500 | 0.8833 | 0.9667 | 0.9667 | 0.9833 | 0.9333 |
| **QRO** | 0.9833 | 0.9833 | 0.9500 | 0.9167 | 0.9833 | 0.9667 | 0.9167 | 0.9667 | 0.8667 | 0.9667 | 0.9833 | 0.9000 | 0.9167 | 0.9667 | 0.9333 | 0.9833 |
| **ROO** | 0.8500 | 0.9167 | 0.9000 | 0.9833 | 0.9167 | 0.9333 | 0.9333 | 0.8667 | 0.7833 | 0.8667 | 0.8500 | 0.9333 | 0.7500 | 0.8667 | 0.7833 | 0.9167 |
| **SLP** | 0.9500 | 0.9833 | 0.9500 | 0.9000 | 0.9833 | 0.9667 | 0.9500 | 0.9667 | 0.9000 | 0.9667 | 0.9500 | 0.9000 | 0.9500 | 0.9667 | 0.9333 | 0.9833 |
| **SIN** | 0.8833 | 0.9167 | 0.8667 | 0.9833 | 0.9167 | 0.9500 | 0.9333 | 0.8667 | 0.7833 | 0.8667 | 0.8833 | 0.9500 | 0.7500 | 0.8667 | 0.8333 | 0.9167 |
| **SON** | 0.9500 | 0.9833 | 0.9333 | 0.9500 | 0.9833 | 0.9667 | 0.9000 | 0.9667 | 0.8500 | 0.9667 | 0.9500 | 0.9000 | 0.8833 | 0.9667 | 0.8833 | 0.9833 |
| **TAB** | 0.8667 | 0.9333 | 0.8833 | 1.0000 | 0.9333 | 0.9667 | 0.9500 | 0.8833 | 0.8000 | 0.8833 | 0.8667 | 0.9667 | 0.7667 | 0.8833 | 0.8167 | 0.9333 |
| **TAM** | 0.9167 | 0.9667 | 0.9000 | 0.9833 | 0.9667 | 0.9833 | 0.9333 | 0.9333 | 0.8333 | 0.9333 | 0.9167 | 0.9500 | 0.8333 | 0.9333 | 0.8667 | 0.9667 |
| **TLX** | 0.9500 | 0.9333 | 0.9000 | 0.7667 | 0.9333 | 0.8833 | 0.8333 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.8000 | 1.0000 | 0.9667 | 0.9500 | 0.9333 |
| **VER** | 0.9167 | 0.9667 | 0.9167 | 0.9333 | 0.9667 | 0.9833 | 0.9833 | 0.9333 | 0.8833 | 0.9333 | 0.9167 | 0.9500 | 0.9000 | 0.9333 | 0.9167 | 0.9667 |
| **YUC** | 0.8833 | 0.9167 | 0.8833 | 0.9333 | 0.9167 | 0.9500 | 0.9833 | 0.8667 | 0.8333 | 0.8667 | 0.8833 | 0.9500 | 0.8167 | 0.8667 | 0.8833 | 0.9167 |
| **ZAC** | 1.0000 | 0.9667 | 0.9167 | 0.8667 | 0.9667 | 0.9333 | 0.8667 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.8667 | 0.9500 | 0.9833 | 0.9667 | 0.9667 |

Table A-5 (cont.)

| | MOR | NAY | NLE | OAX | PUE | QRO | ROO | SLP | SIN | SON | TAB | TAM | TLX | VER | YUC | ZAC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 0.9333 | 0.9333 | 0.9500 | 0.9167 | 0.9500 | 0.9833 | 0.8500 | 0.9500 | 0.8833 | 0.9500 | 0.8667 | 0.9167 | 0.9500 | 0.9167 | 0.8833 | 1.0000 |
| **BCN** | 0.9333 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9333 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9667 |
| **BCS** | 0.8333 | 0.9333 | 0.9333 | 0.9167 | 0.8500 | 0.9500 | 0.9000 | 0.9500 | 0.8667 | 0.9333 | 0.8833 | 0.9000 | 0.9000 | 0.9167 | 0.8833 | 0.9167 |
| **CAMP** | 0.9000 | 0.9667 | 0.9500 | 0.9333 | 0.8333 | 0.9167 | 0.9833 | 0.9000 | 0.9833 | 0.9500 | 1.0000 | 0.9833 | 0.7667 | 0.9333 | 0.9333 | 0.8667 |
| **COA** | 0.9333 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9333 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9667 |
| **COL** | 0.9500 | 1.0000 | 0.9667 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.9667 | 0.9667 | 0.9833 | 0.8833 | 0.9833 | 0.9500 | 0.9333 |
| **CHAP** | 0.9000 | 0.9667 | 0.9000 | 0.9833 | 0.8833 | 0.9167 | 0.9333 | 0.9500 | 0.9333 | 0.9000 | 0.9500 | 0.9333 | 0.8333 | 0.9833 | 0.9833 | 0.8667 |
| **CHI** | 0.9500 | 0.9500 | 0.9667 | 0.9333 | 0.9667 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9667 | 0.8833 | 0.9333 | 0.9667 | 0.9333 | 0.8667 | 0.9833 |
| **DIF** | 0.9500 | 0.8667 | 0.8500 | 0.8833 | 0.9833 | 0.8667 | 0.7833 | 0.9000 | 0.7833 | 0.8500 | 0.8000 | 0.8333 | 0.9333 | 0.8833 | 0.8333 | 0.9167 |
| **DUR** | 0.9500 | 0.9500 | 0.9667 | 0.9333 | 0.9667 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9667 | 0.8833 | 0.9333 | 0.9667 | 0.9333 | 0.8667 | 0.9833 |
| **GTO** | 0.9333 | 0.9333 | 0.9500 | 0.9167 | 0.9500 | 0.9833 | 0.8500 | 0.9500 | 0.8833 | 0.9500 | 0.8667 | 0.9167 | 0.9500 | 0.9167 | 0.8833 | 1.0000 |
| **GRO** | 0.9500 | 0.9667 | 0.9000 | 0.9500 | 0.8833 | 0.9000 | 0.9333 | 0.9000 | 0.9500 | 0.9000 | 0.9667 | 0.9500 | 0.8000 | 0.9500 | 0.9500 | 0.8667 |
| **HGO** | 0.9000 | 0.8833 | 0.8833 | 0.9000 | 0.9667 | 0.9167 | 0.7500 | 0.9500 | 0.7500 | 0.8833 | 0.7667 | 0.8333 | 1.0000 | 0.9000 | 0.8167 | 0.9500 |
| **JAL** | 0.9500 | 0.9500 | 0.9667 | 0.9333 | 0.9667 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9667 | 0.8833 | 0.9333 | 0.9667 | 0.9333 | 0.8667 | 0.9833 |
| **MEX** | 0.9500 | 0.9000 | 0.8833 | 0.9167 | 0.9833 | 0.9333 | 0.7833 | 0.9333 | 0.8333 | 0.8833 | 0.8167 | 0.8667 | 0.9500 | 0.9167 | 0.8833 | 0.9667 |
| **MIC** | 0.9333 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9833 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9333 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9667 |
| **MOR** | 1.0000 | 0.9500 | 0.9167 | 0.9333 | 0.9667 | 0.9167 | 0.8500 | 0.9167 | 0.8833 | 0.9167 | 0.9000 | 0.9333 | 0.9000 | 0.9333 | 0.8833 | 0.9333 |
| **NAY** | 0.9500 | 1.0000 | 0.9667 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9500 | 0.9667 | 0.9667 | 0.9833 | 0.8833 | 0.9833 | 0.9500 | 0.9333 |
| **NLE** | 0.9167 | 0.9667 | 1.0000 | 0.9333 | 0.9000 | 0.9667 | 0.9333 | 0.9500 | 0.9333 | 1.0000 | 0.9500 | 0.9833 | 0.8833 | 0.9333 | 0.8833 | 0.9500 |
| **OAX** | 0.9333 | 0.9833 | 0.9333 | 1.0000 | 0.9333 | 0.9500 | 0.9000 | 0.9833 | 0.9167 | 0.9333 | 0.9333 | 0.9500 | 0.9000 | 1.0000 | 0.9667 | 0.9167 |
| **PUE** | 0.9667 | 0.9167 | 0.9000 | 0.9333 | 1.0000 | 0.9167 | 0.8000 | 0.9500 | 0.8167 | 0.9000 | 0.8333 | 0.8833 | 0.9667 | 0.9333 | 0.8667 | 0.9500 |
| **QRO** | 0.9167 | 0.9667 | 0.9667 | 0.9500 | 0.9167 | 1.0000 | 0.9000 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9500 | 0.9167 | 0.9500 | 0.9333 | 0.9833 |
| **ROO** | 0.8500 | 0.9333 | 0.9333 | 0.9000 | 0.8000 | 0.9000 | 1.0000 | 0.8833 | 0.9667 | 0.9333 | 0.9833 | 0.9500 | 0.7500 | 0.9000 | 0.9167 | 0.8500 |
| **SLP** | 0.9167 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 0.9667 | 0.8833 | 1.0000 | 0.8833 | 0.9500 | 0.9000 | 0.9333 | 0.9500 | 0.9833 | 0.9333 | 0.9500 |
| **SIN** | 0.8833 | 0.9500 | 0.9333 | 0.9167 | 0.8167 | 0.9333 | 0.9667 | 0.8833 | 1.0000 | 0.9333 | 0.9833 | 0.9667 | 0.7500 | 0.9167 | 0.9500 | 0.8833 |
| **SON** | 0.9167 | 0.9667 | 1.0000 | 0.9333 | 0.9000 | 0.9667 | 0.9333 | 0.9500 | 0.9333 | 1.0000 | 0.9500 | 0.9833 | 0.8833 | 0.9333 | 0.8833 | 0.9500 |
| **TAB** | 0.9000 | 0.9667 | 0.9500 | 0.9333 | 0.8333 | 0.9167 | 0.9833 | 0.9000 | 0.9833 | 0.9500 | 1.0000 | 0.9833 | 0.7667 | 0.9333 | 0.9333 | 0.8667 |
| **TAM** | 0.9333 | 0.9833 | 0.9833 | 0.9500 | 0.8833 | 0.9500 | 0.9500 | 0.9333 | 0.9667 | 0.9833 | 0.9833 | 1.0000 | 0.8333 | 0.9500 | 0.9167 | 0.9167 |
| **TLX** | 0.9000 | 0.8833 | 0.8833 | 0.9000 | 0.9667 | 0.9167 | 0.7500 | 0.9500 | 0.7500 | 0.8833 | 0.7667 | 0.8333 | 1.0000 | 0.9000 | 0.8167 | 0.9500 |
| **VER** | 0.9333 | 0.9833 | 0.9333 | 1.0000 | 0.9333 | 0.9500 | 0.9000 | 0.9833 | 0.9167 | 0.9333 | 0.9333 | 0.9500 | 0.9000 | 1.0000 | 0.9667 | 0.9167 |
| **YUC** | 0.8833 | 0.9500 | 0.8833 | 0.9667 | 0.8667 | 0.9333 | 0.9167 | 0.9333 | 0.9500 | 0.8833 | 0.9333 | 0.9167 | 0.8167 | 0.9667 | 1.0000 | 0.8833 |
| **ZAC** | 0.9333 | 0.9333 | 0.9500 | 0.9167 | 0.9500 | 0.9833 | 0.8500 | 0.9500 | 0.8833 | 0.9500 | 0.8667 | 0.9167 | 0.9500 | 0.9167 | 0.8833 | 1.0000 |

Table A-6: Rank correlations between the States in 2000, on the basis of Correspondence Analysis

| | AGS | BCN | BCS | CAMP | COA | COL | CHAP | CHI | DIF | DUR | GTO | GRO | HGO | JAL | MEX | MIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 1.0000 | 0.9000 | 0.8500 | 0.8500 | 0.9167 | 0.8833 | 0.8833 | 0.9500 | 0.9333 | 0.9667 | 0.9833 | 0.9167 | 0.9000 | 0.9833 | 0.9667 | 0.9500 |
| **BCN** | 0.9000 | 1.0000 | 0.9667 | 0.9500 | 0.9667 | 0.9833 | 0.9833 | 0.9000 | 0.9333 | 0.8333 | 0.8833 | 0.9167 | 0.8333 | 0.8833 | 0.8667 | 0.9000 |
| **BCS** | 0.8500 | 0.9667 | 1.0000 | 0.9167 | 0.9667 | 0.9833 | 0.9833 | 0.9000 | 0.8667 | 0.8333 | 0.8667 | 0.9000 | 0.8833 | 0.8667 | 0.8333 | 0.9000 |
| **CAMP** | 0.8500 | 0.9500 | 0.9167 | 1.0000 | 0.9333 | 0.9667 | 0.9667 | 0.9000 | 0.9167 | 0.8000 | 0.8667 | 0.9333 | 0.7833 | 0.8667 | 0.8833 | 0.9000 |
| **COA** | 0.9167 | 0.9667 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9000 | 0.9333 | 0.9000 | 0.9167 | 0.9333 | 0.9000 | 0.9667 |
| **COL** | 0.8833 | 0.9833 | 0.9833 | 0.9667 | 0.9833 | 1.0000 | 1.0000 | 0.9333 | 0.9167 | 0.8500 | 0.9000 | 0.9333 | 0.8667 | 0.9000 | 0.8833 | 0.9333 |
| **CHAP** | 0.8833 | 0.9833 | 0.9833 | 0.9667 | 0.9833 | 1.0000 | 1.0000 | 0.9333 | 0.9167 | 0.8500 | 0.9000 | 0.9333 | 0.8667 | 0.9000 | 0.8833 | 0.9333 |
| **CHI** | 0.9500 | 0.9000 | 0.9000 | 0.9000 | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9333 | 0.9667 | 0.9833 | 0.9167 | 0.9500 | 0.9833 | 0.9667 | 1.0000 |
| **DIF** | 0.9333 | 0.9333 | 0.8667 | 0.9167 | 0.9333 | 0.9167 | 0.9167 | 0.9333 | 1.0000 | 0.9000 | 0.9167 | 0.8833 | 0.8667 | 0.9167 | 0.9333 | 0.9333 |
| **DUR** | 0.9667 | 0.8333 | 0.8333 | 0.8000 | 0.9000 | 0.8500 | 0.8500 | 0.9667 | 0.9000 | 1.0000 | 0.9833 | 0.8833 | 0.9667 | 0.9833 | 0.9667 | 0.9667 |
| **GTO** | 0.9833 | 0.8833 | 0.8667 | 0.8667 | 0.9333 | 0.9000 | 0.9000 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9833 |
| **GRO** | 0.9167 | 0.9167 | 0.9000 | 0.9333 | 0.9000 | 0.9333 | 0.9333 | 0.9167 | 0.8833 | 0.8833 | 0.9333 | 1.0000 | 0.8333 | 0.9333 | 0.9500 | 0.9167 |
| **HGO** | 0.9000 | 0.8333 | 0.8833 | 0.7833 | 0.9167 | 0.8667 | 0.8667 | 0.9500 | 0.8667 | 0.9667 | 0.9333 | 0.8333 | 1.0000 | 0.9333 | 0.9000 | 0.9500 |
| **JAL** | 0.9833 | 0.8833 | 0.8667 | 0.8667 | 0.9333 | 0.9000 | 0.9000 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9833 |
| **MEX** | 0.9667 | 0.8667 | 0.8333 | 0.8833 | 0.9000 | 0.8833 | 0.8833 | 0.9667 | 0.9333 | 0.9667 | 0.9833 | 0.9500 | 0.9000 | 0.9833 | 1.0000 | 0.9667 |
| **MIC** | 0.9500 | 0.9000 | 0.9000 | 0.9000 | 0.9667 | 0.9333 | 0.9333 | 1.0000 | 0.9333 | 0.9667 | 0.9833 | 0.9167 | 0.9500 | 0.9833 | 0.9667 | 1.0000 |
| **MOR** | 0.9667 | 0.8667 | 0.8333 | 0.8833 | 0.9000 | 0.8833 | 0.8833 | 0.9667 | 0.9333 | 0.9667 | 0.9833 | 0.9500 | 0.9000 | 0.9833 | 1.0000 | 0.9667 |
| **NAY** | 0.9000 | 0.9500 | 0.9667 | 0.9500 | 0.9667 | 0.9833 | 0.9833 | 0.9500 | 0.8833 | 0.8833 | 0.9333 | 0.9667 | 0.8833 | 0.9333 | 0.9167 | 0.9500 |
| **NLE** | 0.8667 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.9333 | 0.8333 | 0.8833 | 0.9500 | 0.8333 | 0.8833 | 0.9000 | 0.9167 |
| **OAX** | 0.9333 | 0.9333 | 0.9167 | 0.9167 | 0.9833 | 0.9500 | 0.9500 | 0.9833 | 0.9667 | 0.9333 | 0.9500 | 0.8833 | 0.9333 | 0.9500 | 0.9333 | 0.9833 |
| **PUE** | 0.9167 | 0.8833 | 0.8833 | 0.8500 | 0.9500 | 0.9000 | 0.9000 | 0.9667 | 0.9500 | 0.9500 | 0.9333 | 0.8333 | 0.9667 | 0.9333 | 0.9167 | 0.9667 |
| **QRO** | 0.9833 | 0.8833 | 0.8667 | 0.8667 | 0.9333 | 0.9000 | 0.9000 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9833 |
| **ROO** | 0.8667 | 0.9167 | 0.8667 | 0.9833 | 0.9167 | 0.9333 | 0.9333 | 0.9167 | 0.9500 | 0.8333 | 0.8833 | 0.9167 | 0.8000 | 0.8833 | 0.9167 | 0.9167 |
| **SLP** | 0.9167 | 0.9667 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9000 | 0.9333 | 0.9000 | 0.9167 | 0.9333 | 0.9000 | 0.9667 |
| **SIN** | 0.8833 | 0.9833 | 0.9833 | 0.9667 | 0.9833 | 1.0000 | 1.0000 | 0.9333 | 0.9167 | 0.8500 | 0.9000 | 0.9333 | 0.8667 | 0.9000 | 0.8833 | 0.9333 |
| **SON** | 0.9167 | 0.9667 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9833 | 0.9667 | 0.9333 | 0.9000 | 0.9333 | 0.9000 | 0.9167 | 0.9333 | 0.9000 | 0.9667 |
| **TAB** | 0.8667 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 0.9833 | 0.9833 | 0.9167 | 0.9333 | 0.8333 | 0.8833 | 0.9500 | 0.8333 | 0.8833 | 0.9000 | 0.9167 |
| **TAM** | 0.8833 | 0.9833 | 0.9833 | 0.9667 | 0.9833 | 1.0000 | 1.0000 | 0.9333 | 0.9167 | 0.8500 | 0.9000 | 0.9333 | 0.8667 | 0.9000 | 0.8833 | 0.9333 |
| **TLX** | 0.9667 | 0.8333 | 0.8333 | 0.8000 | 0.9000 | 0.8500 | 0.8500 | 0.9667 | 0.9000 | 1.0000 | 0.9833 | 0.8833 | 0.9667 | 0.9833 | 0.9667 | 0.9667 |
| **VER** | 0.9333 | 0.9333 | 0.9167 | 0.9167 | 0.9833 | 0.9500 | 0.9500 | 0.9833 | 0.9667 | 0.9333 | 0.9500 | 0.8833 | 0.9333 | 0.9500 | 0.9333 | 0.9833 |
| **YUC** | 0.9000 | 0.9000 | 0.8667 | 0.9500 | 0.8833 | 0.9167 | 0.9167 | 0.9000 | 0.8667 | 0.8500 | 0.9167 | 0.9833 | 0.7833 | 0.9167 | 0.9333 | 0.9000 |
| **ZAC** | 0.9833 | 0.8833 | 0.8667 | 0.8667 | 0.9333 | 0.9000 | 0.9000 | 0.9833 | 0.9167 | 0.9833 | 1.0000 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9833 |

Table A-6 (cont.)

| | MOR | NAY | NLE | OAX | PUE | QRO | ROO | SLP | SIN | SON | TAB | TAM | TLX | VER | YUC | ZAC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 0.9667 | 0.9000 | 0.8667 | 0.9333 | 0.9167 | 0.9833 | 0.8667 | 0.9167 | 0.8833 | 0.9167 | 0.8667 | 0.8833 | 0.9667 | 0.9333 | 0.9000 | 0.9833 |
| **BCN** | 0.8667 | 0.9500 | 0.9667 | 0.9333 | 0.8833 | 0.8833 | 0.9167 | 0.9667 | 0.9833 | 0.9667 | 0.9667 | 0.9833 | 0.8333 | 0.9333 | 0.9000 | 0.8833 |
| **BCS** | 0.8333 | 0.9667 | 0.9500 | 0.9167 | 0.8833 | 0.8667 | 0.8667 | 0.9667 | 0.9833 | 0.9667 | 0.9500 | 0.9833 | 0.8333 | 0.9167 | 0.8667 | 0.8667 |
| **CAMP** | 0.8833 | 0.9500 | 0.9833 | 0.9167 | 0.8500 | 0.8667 | 0.9833 | 0.9333 | 0.9667 | 0.9333 | 0.9833 | 0.9667 | 0.8000 | 0.9167 | 0.9500 | 0.8667 |
| **COA** | 0.9000 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 0.9333 | 0.9167 | 1.0000 | 0.9833 | 1.0000 | 0.9500 | 0.9833 | 0.9000 | 0.9833 | 0.8833 | 0.9333 |
| **COL** | 0.8833 | 0.9833 | 0.9833 | 0.9500 | 0.9000 | 0.9000 | 0.9333 | 0.9833 | 1.0000 | 0.9833 | 0.9833 | 1.0000 | 0.8500 | 0.9500 | 0.9167 | 0.9000 |
| **CHAP** | 0.8833 | 0.9833 | 0.9833 | 0.9500 | 0.9000 | 0.9000 | 0.9333 | 0.9833 | 1.0000 | 0.9833 | 0.9833 | 1.0000 | 0.8500 | 0.9500 | 0.9167 | 0.9000 |
| **CHI** | 0.9667 | 0.9500 | 0.9167 | 0.9833 | 0.9667 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9333 | 0.9667 | 0.9833 | 0.9000 | 0.9833 |
| **DIF** | 0.9333 | 0.8833 | 0.9333 | 0.9667 | 0.9500 | 0.9167 | 0.9500 | 0.9333 | 0.9167 | 0.9333 | 0.9333 | 0.9167 | 0.9000 | 0.9667 | 0.8667 | 0.9167 |
| **DUR** | 0.9667 | 0.8833 | 0.8333 | 0.9333 | 0.9500 | 0.9833 | 0.8333 | 0.9000 | 0.8500 | 0.9000 | 0.8333 | 0.8500 | 1.0000 | 0.9333 | 0.8500 | 0.9833 |
| **GTO** | 0.9833 | 0.9333 | 0.8833 | 0.9500 | 0.9333 | 1.0000 | 0.8833 | 0.9333 | 0.9000 | 0.9333 | 0.8833 | 0.9000 | 0.9833 | 0.9500 | 0.9167 | 1.0000 |
| **GRO** | 0.9500 | 0.9667 | 0.9500 | 0.8833 | 0.8333 | 0.9333 | 0.9167 | 0.9000 | 0.9333 | 0.9000 | 0.9500 | 0.9333 | 0.8833 | 0.8833 | 0.9833 | 0.9333 |
| **HGO** | 0.9000 | 0.8833 | 0.8333 | 0.9333 | 0.9667 | 0.9333 | 0.8000 | 0.9167 | 0.8667 | 0.9167 | 0.8333 | 0.8667 | 0.9667 | 0.9333 | 0.7833 | 0.9333 |
| **JAL** | 0.9833 | 0.9333 | 0.8833 | 0.9500 | 0.9333 | 1.0000 | 0.8833 | 0.9333 | 0.9000 | 0.9333 | 0.8833 | 0.9000 | 0.9833 | 0.9500 | 0.9167 | 1.0000 |
| **MEX** | 1.0000 | 0.9167 | 0.9000 | 0.9333 | 0.9167 | 0.9833 | 0.9167 | 0.9000 | 0.8833 | 0.9000 | 0.9000 | 0.8833 | 0.9667 | 0.9333 | 0.9333 | 0.9833 |
| **MIC** | 0.9667 | 0.9500 | 0.9167 | 0.9833 | 0.9667 | 0.9833 | 0.9167 | 0.9667 | 0.9333 | 0.9667 | 0.9167 | 0.9333 | 0.9667 | 0.9833 | 0.9000 | 0.9833 |
| **MOR** | 1.0000 | 0.9167 | 0.9000 | 0.9333 | 0.9167 | 0.9833 | 0.9167 | 0.9000 | 0.8833 | 0.9000 | 0.9000 | 0.8833 | 0.9667 | 0.9333 | 0.9333 | 0.9833 |
| **NAY** | 0.9167 | 1.0000 | 0.9667 | 0.9333 | 0.8833 | 0.9333 | 0.9167 | 0.9667 | 0.9833 | 0.9667 | 0.9667 | 0.9833 | 0.8833 | 0.9333 | 0.9500 | 0.9333 |
| **NLE** | 0.9000 | 0.9667 | 1.0000 | 0.9333 | 0.8833 | 0.8833 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 1.0000 | 0.9833 | 0.8333 | 0.9333 | 0.9333 | 0.8833 |
| **OAX** | 0.9333 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9500 | 0.9333 | 0.9833 | 0.9500 | 0.9833 | 0.9333 | 0.9500 | 0.9333 | 1.0000 | 0.8667 | 0.9500 |
| **PUE** | 0.9167 | 0.8833 | 0.8833 | 0.9833 | 1.0000 | 0.9333 | 0.8833 | 0.9500 | 0.9000 | 0.9500 | 0.8833 | 0.9000 | 0.9500 | 0.9833 | 0.8000 | 0.9333 |
| **QRO** | 0.9833 | 0.9333 | 0.8833 | 0.9500 | 0.9333 | 1.0000 | 0.8833 | 0.9333 | 0.9000 | 0.9333 | 0.8833 | 0.9000 | 0.9833 | 0.9500 | 0.9167 | 1.0000 |
| **ROO** | 0.9167 | 0.9167 | 0.9667 | 0.9333 | 0.8833 | 0.8833 | 1.0000 | 0.9167 | 0.9333 | 0.9167 | 0.9667 | 0.9333 | 0.8333 | 0.9333 | 0.9333 | 0.8833 |
| **SLP** | 0.9000 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 0.9333 | 0.9167 | 1.0000 | 0.9833 | 1.0000 | 0.9500 | 0.9833 | 0.9000 | 0.9833 | 0.8833 | 0.9333 |
| **SIN** | 0.8833 | 0.9833 | 0.9833 | 0.9500 | 0.9000 | 0.9000 | 0.9333 | 0.9833 | 1.0000 | 0.9833 | 0.9833 | 1.0000 | 0.8500 | 0.9500 | 0.9167 | 0.9000 |
| **SON** | 0.9000 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 0.9333 | 0.9167 | 1.0000 | 0.9833 | 1.0000 | 0.9500 | 0.9833 | 0.9000 | 0.9833 | 0.8833 | 0.9333 |
| **TAB** | 0.9000 | 0.9667 | 1.0000 | 0.9333 | 0.8833 | 0.8833 | 0.9667 | 0.9500 | 0.9833 | 0.9500 | 1.0000 | 0.9833 | 0.8333 | 0.9333 | 0.9333 | 0.8833 |
| **TAM** | 0.8833 | 0.9833 | 0.9833 | 0.9500 | 0.9000 | 0.9000 | 0.9333 | 0.9833 | 1.0000 | 0.9833 | 0.9833 | 1.0000 | 0.8500 | 0.9500 | 0.9167 | 0.9000 |
| **TLX** | 0.9667 | 0.8833 | 0.8333 | 0.9333 | 0.9500 | 0.9833 | 0.8333 | 0.9000 | 0.8500 | 0.9000 | 0.8333 | 0.8500 | 1.0000 | 0.9333 | 0.8500 | 0.9833 |
| **VER** | 0.9333 | 0.9333 | 0.9333 | 1.0000 | 0.9833 | 0.9500 | 0.9333 | 0.9833 | 0.9500 | 0.9833 | 0.9333 | 0.9500 | 0.9333 | 1.0000 | 0.8667 | 0.9500 |
| **YUC** | 0.9333 | 0.9500 | 0.9333 | 0.8667 | 0.8000 | 0.9167 | 0.9333 | 0.8833 | 0.9167 | 0.8833 | 0.9333 | 0.9167 | 0.8500 | 0.8667 | 1.0000 | 0.9167 |
| **ZAC** | 0.9833 | 0.9333 | 0.8833 | 0.9500 | 0.9333 | 1.0000 | 0.8833 | 0.9333 | 0.9000 | 0.9333 | 0.8833 | 0.9000 | 0.9833 | 0.9500 | 0.9167 | 1.0000 |

Table A-7: Rank correlations between the States in 2010, on the basis of Correspondence Analysis

| | AGS | BCN | BCS | CAMP | COA | COL | CHAP | CHI | DIF | DUR | GTO | GRO | HGO | JAL | MEX | MIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 1.0000 | 0.9667 | 0.9167 | 0.8667 | 0.9667 | 0.9333 | 0.8500 | 0.9500 | 0.9333 | 0.9333 | 0.9833 | 0.8167 | 0.9333 | 0.9667 | 1.0000 | 0.9167 |
| **BCN** | 0.9667 | 1.0000 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9333 | 0.9667 | 0.9000 | 0.9333 | 0.9333 | 0.8667 | 0.9333 | 1.0000 | 0.9667 | 0.9500 |
| **BCS** | 0.9167 | 0.9667 | 1.0000 | 0.9000 | 0.9667 | 0.9333 | 0.9000 | 0.9167 | 0.8167 | 0.8833 | 0.8833 | 0.8000 | 0.9000 | 0.9667 | 0.9167 | 0.9167 |
| **CAMP** | 0.8667 | 0.9333 | 0.9000 | 1.0000 | 0.9333 | 0.9667 | 0.9500 | 0.8500 | 0.8333 | 0.8000 | 0.8167 | 0.8833 | 0.7833 | 0.9333 | 0.8667 | 0.8500 |
| **COA** | 0.9667 | 1.0000 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9333 | 0.9667 | 0.9000 | 0.9333 | 0.9333 | 0.8667 | 0.9333 | 1.0000 | 0.9667 | 0.9500 |
| **COL** | 0.9333 | 0.9833 | 0.9333 | 0.9667 | 0.9833 | 1.0000 | 0.9667 | 0.9333 | 0.8833 | 0.9000 | 0.9000 | 0.9167 | 0.8833 | 0.9833 | 0.9333 | 0.9333 |
| **CHAP** | 0.8500 | 0.9333 | 0.9000 | 0.9500 | 0.9333 | 0.9667 | 1.0000 | 0.9000 | 0.8333 | 0.8833 | 0.8333 | 0.9667 | 0.8333 | 0.9333 | 0.8500 | 0.9333 |
| **CHI** | 0.9500 | 0.9667 | 0.9167 | 0.8500 | 0.9667 | 0.9333 | 0.9000 | 1.0000 | 0.9333 | 0.9833 | 0.9333 | 0.8667 | 0.9833 | 0.9667 | 0.9500 | 0.9667 |
| **DIF** | 0.9333 | 0.9000 | 0.8167 | 0.8333 | 0.9000 | 0.8833 | 0.8333 | 0.9333 | 1.0000 | 0.9000 | 0.9000 | 0.8333 | 0.9167 | 0.9000 | 0.9333 | 0.8500 |
| **DUR** | 0.9333 | 0.9333 | 0.8833 | 0.8000 | 0.9333 | 0.9000 | 0.8833 | 0.9833 | 0.9000 | 1.0000 | 0.9500 | 0.8833 | 0.9667 | 0.9333 | 0.9333 | 0.9833 |
| **GTO** | 0.9833 | 0.9333 | 0.8833 | 0.8167 | 0.9333 | 0.9000 | 0.8333 | 0.9333 | 0.9000 | 0.9500 | 1.0000 | 0.8333 | 0.9167 | 0.9333 | 0.9833 | 0.9333 |
| **GRO** | 0.8167 | 0.8667 | 0.8000 | 0.8833 | 0.8667 | 0.9167 | 0.9667 | 0.8667 | 0.8333 | 0.8833 | 0.8333 | 1.0000 | 0.8000 | 0.8667 | 0.8167 | 0.9167 |
| **HGO** | 0.9333 | 0.9333 | 0.9000 | 0.7833 | 0.9333 | 0.8833 | 0.8333 | 0.9833 | 0.9167 | 0.9667 | 0.9167 | 0.8000 | 1.0000 | 0.9333 | 0.9333 | 0.9333 |
| **JAL** | 0.9667 | 1.0000 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9333 | 0.9667 | 0.9000 | 0.9333 | 0.9333 | 0.8667 | 0.9333 | 1.0000 | 0.9667 | 0.9500 |
| **MEX** | 1.0000 | 0.9667 | 0.9167 | 0.8667 | 0.9667 | 0.9333 | 0.8500 | 0.9500 | 0.9333 | 0.9333 | 0.9833 | 0.8167 | 0.9333 | 0.9667 | 1.0000 | 0.9167 |
| **MIC** | 0.9167 | 0.9500 | 0.9167 | 0.8500 | 0.9500 | 0.9333 | 0.9333 | 0.9667 | 0.8500 | 0.9833 | 0.9333 | 0.9167 | 0.9333 | 0.9500 | 0.9167 | 1.0000 |
| **MOR** | 0.9167 | 0.9500 | 0.8667 | 0.9500 | 0.9500 | 0.9833 | 0.9500 | 0.9167 | 0.9167 | 0.8833 | 0.8833 | 0.9333 | 0.8667 | 0.9500 | 0.9167 | 0.9000 |
| **NAY** | 0.8833 | 0.9333 | 0.8833 | 0.8833 | 0.9333 | 0.9500 | 0.9667 | 0.9333 | 0.8333 | 0.9500 | 0.9000 | 0.9667 | 0.8833 | 0.9333 | 0.8833 | 0.9833 |
| **NLE** | 0.9667 | 1.0000 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.9333 | 0.9667 | 0.9000 | 0.9333 | 0.9333 | 0.8667 | 0.9333 | 1.0000 | 0.9667 | 0.9500 |
| **OAX** | 0.8833 | 0.9333 | 0.8500 | 0.9167 | 0.9333 | 0.9667 | 0.9667 | 0.9333 | 0.9000 | 0.9167 | 0.8667 | 0.9667 | 0.8833 | 0.9333 | 0.8833 | 0.9333 |
| **PUE** | 0.9500 | 0.9667 | 0.9167 | 0.8500 | 0.9667 | 0.9333 | 0.9000 | 1.0000 | 0.9333 | 0.9833 | 0.9333 | 0.8667 | 0.9833 | 0.9667 | 0.9500 | 0.9667 |
| **QRO** | 0.9333 | 0.9333 | 0.9000 | 0.8333 | 0.9333 | 0.9167 | 0.9000 | 0.9333 | 0.8333 | 0.9667 | 0.9667 | 0.9000 | 0.9000 | 0.9333 | 0.9333 | 0.9833 |
| **ROO** | 0.8500 | 0.9167 | 0.9000 | 0.9333 | 0.9167 | 0.9333 | 0.9500 | 0.8500 | 0.8167 | 0.8167 | 0.8167 | 0.8833 | 0.7667 | 0.9167 | 0.8500 | 0.8667 |
| **SLP** | 0.9333 | 0.9833 | 0.9500 | 0.9000 | 0.9833 | 0.9667 | 0.9500 | 0.9833 | 0.8833 | 0.9667 | 0.9167 | 0.9000 | 0.9500 | 0.9833 | 0.9333 | 0.9833 |
| **SIN** | 0.8833 | 0.9167 | 0.8833 | 0.9833 | 0.9167 | 0.9500 | 0.9167 | 0.8167 | 0.8167 | 0.7833 | 0.8500 | 0.8667 | 0.7500 | 0.9167 | 0.8833 | 0.8333 |
| **SON** | 0.9333 | 0.9833 | 0.9500 | 0.9000 | 0.9833 | 0.9667 | 0.9500 | 0.9833 | 0.8833 | 0.9667 | 0.9167 | 0.9000 | 0.9500 | 0.9833 | 0.9333 | 0.9833 |
| **TAB** | 0.8833 | 0.9500 | 0.9167 | 0.9833 | 0.9500 | 0.9833 | 0.9833 | 0.8833 | 0.8500 | 0.8500 | 0.8500 | 0.9333 | 0.8167 | 0.9500 | 0.8833 | 0.9000 |
| **TAM** | 0.9333 | 0.9833 | 0.9333 | 0.9667 | 0.9833 | 1.0000 | 0.9667 | 0.9333 | 0.8833 | 0.9000 | 0.9000 | 0.9167 | 0.8833 | 0.9833 | 0.9333 | 0.9333 |
| **TLX** | 0.9667 | 0.9500 | 0.9167 | 0.8167 | 0.9500 | 0.9000 | 0.8167 | 0.9667 | 0.9333 | 0.9333 | 0.9333 | 0.7667 | 0.9833 | 0.9500 | 0.9667 | 0.9000 |
| **VER** | 0.9000 | 0.9667 | 0.9167 | 0.9333 | 0.9667 | 0.9833 | 0.9833 | 0.9500 | 0.8667 | 0.9333 | 0.8833 | 0.9500 | 0.9000 | 0.9667 | 0.9000 | 0.9667 |
| **YUC** | 0.8667 | 0.8833 | 0.8333 | 0.8833 | 0.8833 | 0.9167 | 0.9167 | 0.8167 | 0.7833 | 0.8333 | 0.8833 | 0.9167 | 0.7333 | 0.8833 | 0.8667 | 0.8833 |
| **ZAC** | 0.9500 | 0.9167 | 0.8667 | 0.7833 | 0.9167 | 0.8833 | 0.8500 | 0.9500 | 0.8833 | 0.9833 | 0.9833 | 0.8667 | 0.9333 | 0.9167 | 0.9500 | 0.9667 |

Table A-7 (cont.)

| | MOR | NAY | NLE | OAX | PUE | QRO | ROO | SLP | SIN | SON | TAB | TAM | TLX | VER | YUC | ZAC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGS** | 0.9167 | 0.8833 | 0.9667 | 0.8833 | 0.9500 | 0.9333 | 0.8500 | 0.9333 | 0.8833 | 0.9333 | 0.8833 | 0.9333 | 0.9667 | 0.9000 | 0.8667 | 0.9500 |
| **BCN** | 0.9500 | 0.9333 | 1.0000 | 0.9333 | 0.9667 | 0.9333 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9500 | 0.9833 | 0.9500 | 0.9667 | 0.8833 | 0.9167 |
| **BCS** | 0.8667 | 0.8833 | 0.9667 | 0.8500 | 0.9167 | 0.9000 | 0.9000 | 0.9500 | 0.8833 | 0.9500 | 0.9167 | 0.9333 | 0.9167 | 0.9167 | 0.8333 | 0.8667 |
| **CAMP** | 0.9500 | 0.8833 | 0.9333 | 0.9167 | 0.8500 | 0.8333 | 0.9333 | 0.9000 | 0.9833 | 0.9000 | 0.9833 | 0.9667 | 0.8167 | 0.9333 | 0.8833 | 0.7833 |
| **COA** | 0.9500 | 0.9333 | 1.0000 | 0.9333 | 0.9667 | 0.9333 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9500 | 0.9833 | 0.9500 | 0.9667 | 0.8833 | 0.9167 |
| **COL** | 0.9833 | 0.9500 | 0.9833 | 0.9667 | 0.9333 | 0.9167 | 0.9333 | 0.9667 | 0.9500 | 0.9667 | 0.9833 | 1.0000 | 0.9000 | 0.9833 | 0.9167 | 0.8833 |
| **CHAP** | 0.9500 | 0.9667 | 0.9333 | 0.9667 | 0.9000 | 0.9000 | 0.9500 | 0.9500 | 0.9167 | 0.9500 | 0.9833 | 0.9667 | 0.8167 | 0.9833 | 0.9167 | 0.8500 |
| **CHI** | 0.9167 | 0.9333 | 0.9667 | 0.9333 | 1.0000 | 0.9333 | 0.8500 | 0.9833 | 0.8167 | 0.9833 | 0.8833 | 0.9333 | 0.9667 | 0.9500 | 0.8167 | 0.9500 |
| **DIF** | 0.9167 | 0.8333 | 0.9000 | 0.9000 | 0.9333 | 0.8333 | 0.8167 | 0.8833 | 0.8167 | 0.8833 | 0.8500 | 0.8833 | 0.9333 | 0.8667 | 0.7833 | 0.8833 |
| **DUR** | 0.8833 | 0.9500 | 0.9333 | 0.9167 | 0.9833 | 0.9667 | 0.8167 | 0.9667 | 0.7833 | 0.9667 | 0.8500 | 0.9000 | 0.9333 | 0.9333 | 0.8333 | 0.9833 |
| **GTO** | 0.8833 | 0.9000 | 0.9333 | 0.8667 | 0.9333 | 0.9667 | 0.8167 | 0.9167 | 0.8500 | 0.9167 | 0.8500 | 0.9000 | 0.9333 | 0.8833 | 0.8833 | 0.9833 |
| **GRO** | 0.9333 | 0.9667 | 0.8667 | 0.9667 | 0.8667 | 0.9000 | 0.8833 | 0.9000 | 0.8667 | 0.9000 | 0.9333 | 0.9167 | 0.7667 | 0.9500 | 0.9167 | 0.8667 |
| **HGO** | 0.8667 | 0.8833 | 0.9333 | 0.8833 | 0.9833 | 0.9000 | 0.7667 | 0.9500 | 0.7500 | 0.9500 | 0.8167 | 0.8833 | 0.9833 | 0.9000 | 0.7333 | 0.9333 |
| **JAL** | 0.9500 | 0.9333 | 1.0000 | 0.9333 | 0.9667 | 0.9333 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9500 | 0.9833 | 0.9500 | 0.9667 | 0.8833 | 0.9167 |
| **MEX** | 0.9167 | 0.8833 | 0.9667 | 0.8833 | 0.9500 | 0.9333 | 0.8500 | 0.9333 | 0.8833 | 0.9333 | 0.8833 | 0.9333 | 0.9667 | 0.9000 | 0.8667 | 0.9500 |
| **MIC** | 0.9000 | 0.9833 | 0.9500 | 0.9333 | 0.9667 | 0.9833 | 0.8667 | 0.9833 | 0.8333 | 0.9833 | 0.9000 | 0.9333 | 0.9000 | 0.9667 | 0.8833 | 0.9667 |
| **MOR** | 1.0000 | 0.9333 | 0.9500 | 0.9833 | 0.9167 | 0.8833 | 0.9000 | 0.9333 | 0.9333 | 0.9333 | 0.9667 | 0.9833 | 0.8833 | 0.9667 | 0.9000 | 0.8667 |
| **NAY** | 0.9333 | 1.0000 | 0.9333 | 0.9667 | 0.9333 | 0.9667 | 0.8833 | 0.9667 | 0.8667 | 0.9667 | 0.9333 | 0.9500 | 0.8500 | 0.9833 | 0.9167 | 0.9333 |
| **NLE** | 0.9500 | 0.9333 | 1.0000 | 0.9333 | 0.9667 | 0.9333 | 0.9167 | 0.9833 | 0.9167 | 0.9833 | 0.9500 | 0.9833 | 0.9500 | 0.9667 | 0.8833 | 0.9167 |
| **OAX** | 0.9833 | 0.9667 | 0.9333 | 1.0000 | 0.9333 | 0.9000 | 0.8833 | 0.9500 | 0.8833 | 0.9500 | 0.9500 | 0.9667 | 0.8667 | 0.9833 | 0.8833 | 0.8833 |
| **PUE** | 0.9167 | 0.9333 | 0.9667 | 0.9333 | 1.0000 | 0.9333 | 0.8500 | 0.9833 | 0.8167 | 0.9833 | 0.8833 | 0.9333 | 0.9667 | 0.9500 | 0.8167 | 0.9500 |
| **QRO** | 0.8833 | 0.9667 | 0.9333 | 0.9000 | 0.9333 | 1.0000 | 0.8500 | 0.9500 | 0.8500 | 0.9500 | 0.8833 | 0.9167 | 0.8833 | 0.9333 | 0.9167 | 0.9833 |
| **ROO** | 0.9000 | 0.8833 | 0.9167 | 0.8833 | 0.8500 | 0.8500 | 1.0000 | 0.9000 | 0.9167 | 0.9000 | 0.9667 | 0.9333 | 0.7833 | 0.9167 | 0.9333 | 0.8000 |
| **SLP** | 0.9333 | 0.9667 | 0.9833 | 0.9500 | 0.9833 | 0.9500 | 0.9000 | 1.0000 | 0.8667 | 1.0000 | 0.9333 | 0.9667 | 0.9333 | 0.9833 | 0.8667 | 0.9333 |
| **SIN** | 0.9333 | 0.8667 | 0.9167 | 0.8833 | 0.8167 | 0.8500 | 0.9167 | 0.8667 | 1.0000 | 0.8667 | 0.9667 | 0.9500 | 0.8000 | 0.9000 | 0.9167 | 0.8000 |
| **SON** | 0.9333 | 0.9667 | 0.9833 | 0.9500 | 0.9833 | 0.9500 | 0.9000 | 1.0000 | 0.8667 | 1.0000 | 0.9333 | 0.9667 | 0.9333 | 0.9833 | 0.8667 | 0.9333 |
| **TAB** | 0.9667 | 0.9333 | 0.9500 | 0.9500 | 0.8833 | 0.8833 | 0.9667 | 0.9333 | 0.9667 | 0.9333 | 1.0000 | 0.9833 | 0.8333 | 0.9667 | 0.9333 | 0.8333 |
| **TAM** | 0.9833 | 0.9500 | 0.9833 | 0.9667 | 0.9333 | 0.9167 | 0.9333 | 0.9667 | 0.9500 | 0.9667 | 0.9833 | 1.0000 | 0.9000 | 0.9833 | 0.9167 | 0.8833 |
| **TLX** | 0.8833 | 0.8500 | 0.9500 | 0.8667 | 0.9667 | 0.8833 | 0.7833 | 0.9333 | 0.8000 | 0.9333 | 0.8333 | 0.9000 | 1.0000 | 0.8833 | 0.7500 | 0.9167 |
| **VER** | 0.9667 | 0.9833 | 0.9667 | 0.9833 | 0.9500 | 0.9333 | 0.9167 | 0.9833 | 0.9000 | 0.9833 | 0.9667 | 0.9833 | 0.8833 | 1.0000 | 0.9000 | 0.9000 |
| **YUC** | 0.9000 | 0.9167 | 0.8833 | 0.8833 | 0.8167 | 0.9167 | 0.9333 | 0.8667 | 0.9167 | 0.8667 | 0.9333 | 0.9167 | 0.7500 | 0.9000 | 1.0000 | 0.8667 |
| **ZAC** | 0.8667 | 0.9333 | 0.9167 | 0.8833 | 0.9500 | 0.9833 | 0.8000 | 0.9333 | 0.8000 | 0.9333 | 0.8333 | 0.8833 | 0.9167 | 0.9000 | 0.8667 | 1.0000 |