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Global Trade Analysis Project

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This paper is from the
GTAP Annual Conference on Global Economic Analysis
<https://www.gtap.agecon.purdue.edu/events/conferences/default.asp>

Gtap Ninth Annual Conference, 2006
"Multilateralism, Bilateralism and Development"
Addis Ababa, June 18-22

Comparison of different updating methods for the GTAP data base

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1 Introduction

A Social Accounting Matrix (SAM) is a square matrix whose rows and columns represent the resources and uses of separate economic accounts which together summarize the basic flows within the different groups of transactors or categories of transactions in an economy. The incomings (rows) and outgoings (columns) are necessarily equilibrated following standard economic accounting standards, therefore the sum of columns and rows for each account must be the same. This matrix presents an accounting system that provides information about aspects of an economy like the structure, composition and level of production, the value added generated by the factors of production and the distribution of income among different groups of households. Normally, a SAM is constructed using an Input-Output Table as starting point and includes figures about consumption, the structure of production, and the flows related to foreign trade, savings and investment.

The updating of a SAM consists of determining the SAM corresponding to period $t=T$ starting from a known SAM, which corresponds to moment $t=0$, and from certain available information about the SAM in moment $t=T$. It is a question of finding a SAM X^T whose structure is, in a certain sense, as close as possible to the structure of the SAM in moment $t=0$, X^0 . Normally this structure is defined in terms of the *row (horizontal) coefficients* and the *column (vertical) coefficients*, assuming that if element x_{ij}^0 of the initial matrix is null then the corresponding element x_{ij}^T of the final matrix is also null. If $X=(x_{ij})_{1 \leq i,j \leq n}$ is a SAM and $S^{\neq 0}=\{(i,j) : x_{ij} \neq 0\}$, then the matrix of row coefficients, $A = (a_{ij})_{1 \leq i,j \leq n}$, and that of column coefficients, $B = (b_{ij})_{1 \leq i,j \leq n}$, can be defined as

$$a_{ij} = \frac{x_{ij}}{\sum_j x_{ij}} \quad \text{if } (i,j) \in S, \text{ and } a_{ij} = 0 \text{ if } (i,j) \notin S$$

$$b_{ij} = \frac{x_{ij}}{\sum_i x_{ij}} \quad \text{if } (i,j) \in S, \text{ and } b_{ij} = 0 \text{ if } (i,j) \notin S$$

We consider that the adjustment objective consists of determining a SAM X^T such that the ratios $\frac{a_{ij}^T}{a_{ij}^0}$, or $\frac{b_{ij}^T}{b_{ij}^0}$, for (i,j) belonging to $S=\{(i,j) : 1 \leq i,j \leq n\}$, are as similar as possible to unity, distinguishing between two types of adjustment, the horizontal and the vertical one, depending on whether we approximate the ratios of horizontal or vertical coefficients to unity. The definition of the concept of proximity determines the updating criterium. Assuming that all elements in the matrices are non-negative, for horizontal coefficients, the criteria used in this paper are defined as follows (for the vertical updating, the horizontal coefficients are replaced by the vertical ones):

- Criterion L_1

$$F_1(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} \left| \frac{a_{ij}^T}{a_{ij}^0} - 1 \right|$$

- Criterion L_2

$$F_2(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} \left(\frac{a_{ij}^T}{a_{ij}^0} - 1 \right)^2$$

- Criterion (L_1, L_∞) (weighted sum of L_1 and L_∞)

$$F_3(A^T, A^0) = w_1 \sum_{(i,j) \in S^{\neq 0}} \left| \frac{a_{ij}^T}{a_{ij}^0} - 1 \right| + w_2 \max_{(i,j) \in S^{\neq 0}} \left| \frac{a_{ij}^T}{a_{ij}^0} - 1 \right|$$

where w_1 and w_2 are positive weights.

- Criterion RAS:

$$F_4(A^T, A^0) = RAS(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} \frac{\gamma_i}{\gamma} a_{ij}^T \ln \frac{a_{ij}^T}{a_{ij}^0}$$

- Criterion MSCE: Minimum sum of cross entropies

$$F_5(A^T, A^0) = MSCE(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} a_{ij}^T \ln \frac{a_{ij}^T}{a_{ij}^0}$$

- Criterion Kullback:

$$F_6(A^T, A^0) = K(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} a_{ij}^T \ln \frac{a_{ij}^T}{a_{ij}^0} + \sum_{(i,j) \in S^{\neq 0}} a_{ij}^0 \ln \frac{a_{ij}^0}{a_{ij}^T}$$

Where $\gamma_i = \sum_j x_{ij}$ and $\gamma = \sum_i \gamma_i$. Therefore γ_i is the sum of the elements of row i , which is equal to the sum of the elements of column i , and γ is the sum of all the elements of matrix X^0 .

The updating problem is formulated as an optimization problem where the objective function is one of the previously mentioned and the restrictions are determined by the column and row totals, which are supposed to be known, in addition to other given values.

The vertical criterium F_1 has been used by Matuszewski, Pitts and Sawyer (1964). Criterium F_4 corresponds to the well known RAS algorithm and F_5 is based on an entropy measure which has been used by Golan, Judge and Robinson (1994), and Robinson, Cattaneo and El-Said(2000), among others. Criteria F_4 and F_5 are particular cases of the updating criterion of the minimization of the sum of weighted crossed entropies (McDougall, 1999). In contrast to Criterion F_4 and F_5 , F_6 is a distance in the mathematical sense. Measures F_1 to F_5 have been used by Manrique de Lara and Santos-Peñate (2004).

The basic updating problem is formulated as follows:

$$\min F(A)$$

subject to:

$$\sum_j x_{ij} = \gamma_i, \quad i = 1, \dots, n \quad (1)$$

$$\sum_i x_{ij} = \gamma_j, \quad j = 1, \dots, n \quad (2)$$

$$x_{ij} = 0, \quad \forall (i,j) \notin S^{\neq 0}$$

$$x_{ij} \geq 0, \quad \forall (i,j)$$

where γ_i are given, F is one of the criterion defined previously and $a_{ij} = \frac{x_{ij}}{\gamma_i}, \quad \forall (i, j) \in S$.

More general formulations include other constraints in addition to the balance restrictions. On the other hand, certain situations require some particular treatment; for example, if the structure of the accounting matrices varies in time, which means that the index set with positive values is not constant.

In this paper, we apply the previous criteria to update a SAM for a collection of 75 countries included in the GTAP database. In order to evaluate the results of the updating procedure and compare the criteria used, we calculated the dissimilarities between the initial and final matrices using the measures defined in the appendix. The results provided by the updating procedure can be utilized to classify the set of countries and define different macroeconomic behaviour corresponding to the clusters resulting from this classification. The rest of the paper is organized as follows. In Section 2, we present some computational experience and Section 3 includes some concluding remarks. The appendix1 contains the measures used to calculate the dissimilarity between the initial matrix and the final matrix.

2. Computational experience

In order to prepare National Accounting Matrices (NAM) using the GTAP Database, we proceeded along the indications included GTAP Technical Paper No. 22 (December 2004). For this first essay we generated National accounting matrices with a high level of aggregation (19 accounts):

1.- RREGHOUS:	Regional Households
2.- HHOUS:	Private Household
3.- SSALTAX:	Sales Tax
4.- PPROD TAX:	Production taxes
5.- DDIRTAX:	Direct taxes
6.- GGOVT:	Government
7.- KKAP:	Capital
8.- MM:	Imported Commodities
9.- DD:	Domestic Commodities
10.- AA:	Activities
11.- FF:	Factors
12.- TM:	Import duties
13.- TE:	Export taxes
14.- TS:	Sales Taxes
15.- TF:	Taxes on Factors
16.- OT:	Other trade and transport costs
17.- WT:	Water trade and transport costs
18.- AT:	Air trade and transport costs
19.- WW:	Rest of the World

The objective consists in estimating the NAMs obtained with the version 6.0 GTAP database, using the version 5.4 GTAP database as benchmark data. Therefore we had to retain only the 75 regions common to both GTAP database versions.

The structure of the NAMS for each of the regions changes considerably between both GTAP versions. Table ?? shows the number of cases for which this structure does not hold between version 5.4 and 6.0.

In order to maintain a coherent and simple updating structure, we introduced in the optimization program only those values that were positive in both versions simultaneously. The rest of the values were fixed to the observed values beforehand.

We use the criteria described in Section 1 to update a SAM for each case included in a list of 75 countries considering that the initial and final periods are $t=1954$ and $t=1960$, respectively. The data

were taken from the GTAP database. For each country, a 19×19 SAM was updated assuming all total columns known. In order to avoid feasibility and other mathematical problems produced by the structural differences between the initial and final matrices, we modify the basic updating mathematical program fixing the values of certain cells and excluding from the objective function the indices corresponding to the structural differences. We implemented the different updating approaches in GAMS and use Matlab to calculate the dissimilarity measures between pairs of matrices. For each country, we have a initial SAM and a final SAM, both in the GTAP database, and a SAM obtained from each of the six updating procedures corresponding to the six different updating criterion.

Appendix2 contains the different results obtained by country. For each of the 75 countries considered, we show 23 distance measures for each of the 6 adjustment methods considered.

3. Concluding remarks

In this paper, we have applied six updating criteria to analyze 75 economic scenarios corresponding to 75 countries summarized in the GTAP data base. We have modified the basic updating problem formulation in order to obtain solutions in cases where the structure of the SAM changes in time. Once we have obtained the estimated final matrix for any country, a comparison between any pair of matrices, initial, final and final estimated, is possible. We can compare the updating criteria. Moreover, using these terns of matrices, one can classify the countries and analyze the existence of different macroeconomic behaviours represented by the clusters resulting from the classification.

The first step in the future research will be focused to a deeper analysis of the data, the updating criteria and results. Other subjects are the definition of macroeconomic behaviours by means of cluster analysis, the treatment of different scenarios defined by the set of data we know, and the structural analysis.

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Acknowledges

This work has been partially supported by the *Ministerio de Educación y Ciencia* and *FEDER* (grant MTM2005-09362-C03-03).

Appendix1

The following measures are defined for horizontal coefficients. The definitions for vertical coefficients are similar. Additionally, we calculated the correlation coefficient. As in the previous sections, the notation $S^{\neq 0}$ represents the set of indices (i, j) such that $a_{ij} \neq 0$.

- Metrics L_1 , absolute and relative:

$$L_1(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} |a_{ij}^T - a_{ij}^0|$$

$$L_{1R}(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} \left| \frac{a_{ij}^T}{a_{ij}^0} - 1 \right|$$

- Metrics L_2 , absolute and relative:

$$L_2(A^T, A^0) = \sum_{(i,j) \in S} (a_{ij}^T - a_{ij}^0)^2$$

$$L_{2R}(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} \left(\frac{a_{ij}^T}{a_{ij}^0} - 1 \right)^2$$

- Metrics L_∞ , absolute and relative:

$$L_\infty(A^T, A^0) = \max_{(i,j) \in S} |a_{ij}^T - a_{ij}^0|$$

$$L_{\infty R}(A^T, A^0) = \max_{(i,j) \in S^{\neq 0}} \left| \frac{a_{ij}^T}{a_{ij}^0} - 1 \right|$$

- Theils measure:

$$T(A^T, A^0) = \sqrt{\frac{\sum_{(i,j) \in S} (a_{ij}^T - a_{ij}^0)^2}{\sum_{(i,j) \in S} (a_{ij}^0)^2}}$$

- Weighted absolute difference (WAD), absolute and relative:

$$WAD(A^T, A^0) = \frac{\sum_{(i,j) \in S} |a_{ij}^T + a_{ij}^0| |a_{ij}^T - a_{ij}^0|}{\sum_{(i,j) \in S} |a_{ij}^T + a_{ij}^0|}$$

$$WAD_R(A^T, A^0) = \frac{\sum_{(i,j) \in S^{\neq 0}} \left| \frac{a_{ij}^T}{a_{ij}^0} + 1 \right| \left| \frac{a_{ij}^T}{a_{ij}^0} - 1 \right|}{\sum_{(i,j) \in S^{\neq 0}} \left| \frac{a_{ij}^T}{a_{ij}^0} + 1 \right|}$$

For the following definitions, we will assume that all matrix elements are equal or greater than zero.

- RAS:

$$RAS(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} \frac{\gamma_i}{\gamma} a_{ij}^T \ln \frac{a_{ij}^T}{a_{ij}^0}$$

- Sum of cross entropies (SCE):

$$SCE(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} a_{ij}^T \ln \frac{a_{ij}^T}{a_{ij}^0}$$

- Kullback measure:

$$K(A^T, A^0) = \sum_{(i,j) \in S^{\neq 0}} a_{ij}^T \ln \frac{a_{ij}^T}{a_{ij}^0} + \sum_{(i,j) \in S^{\neq 0}} a_{ij}^0 \ln \frac{a_{ij}^0}{a_{ij}^T}$$

Where $\gamma_i = \sum_j x_{ij}$ and $\gamma = \sum_i \gamma_i$. Therefore γ_i is the sum of the elements of row i , which is equal to the sum of the elements of column i , and γ is the sum of all the elements of matrix X^0 .

APPENDIX 2
RESULTS OBTAINED WITH THE KULLBACK ADJUSTMENT DISTANCE

aus	101.20	19.23	2.88	0.52	1.01	0.41	12.71	0.69	1.72	6.63	0.05	0.05	2.69	3.65	0.62	81.30	9.25	2.39	0.22	0.05	0.20	2.71	8.31
nzl	102.39	19.45	2.91	0.60	1.01	0.42	12.57	0.69	1.85	6.38	0.05	0.05	2.73	3.74	0.64	79.67	9.01	1.83	0.21	0.05	0.20	2.74	8.08
chn	105.23	18.94	2.93	0.71	1.03	0.44	13.13	0.69	2.51	7.94	0.05	0.04	2.70	3.74	0.63	92.81	17.18	13.70	0.50	0.05	0.23	2.77	16.54
hkg	105.98	19.08	2.85	0.51	1.00	0.43	11.83	0.69	1.85	5.97	0.05	0.04	2.70	3.73	0.65	76.65	8.82	1.48	0.20	0.05	0.19	2.69	7.94
jpn	107.60	20.44	3.06	0.75	1.05	0.46	13.94	0.70	2.20	8.10	0.05	0.05	2.75	3.88	0.62	102.98	16.34	10.37	0.48	0.05	0.26	2.89	15.51
kor	109.73	20.85	3.05	0.66	1.00	0.46	12.50	0.69	2.24	6.27	0.05	0.05	2.89	4.19	0.69	84.91	10.38	5.25	0.25	0.05	0.21	2.87	9.47
twm	101.21	18.22	2.79	0.61	1.00	0.41	11.80	0.69	1.68	5.92	0.05	0.04	2.64	3.56	0.63	87.14	13.22	9.23	0.34	0.05	0.22	2.63	12.48
idn	103.03	19.58	2.94	0.79	1.00	0.43	12.51	0.69	1.82	6.29	0.05	0.05	2.78	3.87	0.65	80.71	9.04	1.62	0.21	0.05	0.20	2.77	8.09
mys	223.40	42.45	15.66	10.96	1.00	0.87	12.94	0.69	5.96	7.16	0.05	0.05	15.63	31.00	0.99	83.70	9.53	2.85	0.23	0.11	0.21	15.52	8.57
phl	100.01	19.00	2.85	0.50	1.00	0.40	12.58	0.70	1.65	6.40	0.05	0.05	2.69	3.59	0.62	87.90	11.02	5.68	0.28	0.05	0.22	2.68	10.10
sgp	104.48	18.81	2.82	0.51	1.00	0.42	11.83	0.69	1.65	5.96	0.05	0.04	2.67	3.66	0.64	442.79	367.50	367.40	115.66	0.05	1.11	2.66	366.84
tha	102.43	19.46	2.90	0.65	1.01	0.42	12.76	0.69	1.69	6.71	0.05	0.05	2.71	3.69	0.63	82.98	9.51	3.07	0.23	0.05	0.21	2.73	8.56
vnm	101.15	19.22	2.86	0.61	1.02	0.40	12.77	0.70	1.49	6.74	0.05	0.05	2.65	3.55	0.61	80.86	9.17	1.89	0.21	0.05	0.20	2.70	8.23
bgd	102.76	18.50	2.87	0.69	1.03	0.43	12.32	0.69	2.11	6.77	0.05	0.04	2.64	3.62	0.62	87.84	12.66	8.20	0.33	0.05	0.22	2.72	11.87
ind	100.26	19.05	2.89	0.51	1.00	0.42	12.65	0.69	1.99	6.49	0.05	0.05	2.72	3.70	0.63	85.75	11.46	7.20	0.28	0.05	0.21	2.73	10.63
lka	100.43	19.08	2.87	0.51	1.00	0.41	12.58	0.69	1.56	6.40	0.05	0.05	2.70	3.65	0.63	94.45	17.06	14.46	0.50	0.05	0.24	2.70	16.39
usa	114.19	21.70	3.58	1.75	1.03	0.51	12.66	0.69	2.45	6.52	0.05	0.05	3.33	5.47	0.77	90.70	12.29	7.05	0.32	0.05	0.23	3.41	11.42
can	102.23	19.42	2.88	0.56	1.00	0.43	0.00	0.00	0.00	0.00	0.05	0.00	2.72	0.00	0.00	81.00	9.00	1.00	0.11	0.05	0.20	2.71	8.04
usa	107.21	20.37	3.08	0.79	1.07	0.46	14.14	0.70	2.06	7.86	0.05	0.05	2.71	3.86	0.61	86.22	10.27	3.00	0.24	0.05	0.22	2.91	9.32
mex	100.82	19.15	2.89	0.57	1.00	0.42	12.68	0.69	1.79	6.52	0.05	0.05	2.73	3.71	0.64	85.31	10.17	4.28	0.25	0.05	0.21	2.73	9.23
col	104.06	19.77	2.96	0.62	1.02	0.43	13.90	0.70	2.30	8.27	0.05	0.05	2.74	3.78	0.63	190.63	83.07	74.59	7.86	0.05	0.48	2.79	82.52
per	100.64	19.12	2.90	0.51	1.00	0.43	12.55	0.69	1.80	6.36	0.05	0.05	2.73	3.74	0.64	82.57	9.49	3.12	0.23	0.05	0.21	2.74	8.54
ven	102.27	19.43	2.93	0.58	1.01	0.43	12.97	0.69	2.12	7.03	0.05	0.05	2.73	3.73	0.63	86.33	10.23	3.62	0.25	0.05	0.22	2.76	9.28
xap	103.14	19.60	2.95	0.61	1.03	0.43	13.33	0.70	2.14	7.54	0.05	0.05	2.69	3.70	0.61	201.50	118.39	117.95	15.47	0.05	0.50	2.78	117.96
arg	101.30	19.25	2.90	0.60	1.00	0.42	13.27	0.70	1.97	7.31	0.05	0.05	2.73	3.72	0.64	804.93	714.52	714.36	334.50	0.05	2.01	2.73	713.38
bra	102.52	19.48	2.92	0.58	1.02	0.42	13.52	0.69	2.31	7.77	0.05	0.05	2.70	3.66	0.62	93.47	13.69	8.41	0.37	0.05	0.23	2.75	12.87
chl	113.98	21.66	3.20	0.77	0.99	0.45	12.72	0.69	2.25	6.59	0.05	0.05	3.10	4.68	0.73	84.59	10.21	4.48	0.25	0.05	0.21	3.02	9.29
ury	113.16	21.50	3.33	1.25	0.97	0.40	13.03	0.70	1.96	7.01	0.05	0.05	3.31	5.09	0.77	110.56	24.15	20.91	0.87	0.05	0.28	3.15	23.51
xsm	100.85	19.16	2.87	0.57	1.00	0.41	12.90	0.70	1.70	6.84	0.05	0.05	2.70	3.64	0.63	108.33	18.24	9.45	0.57	0.05	0.27	2.70	17.42
aut	106.46	20.23	2.93	0.50	1.00	0.44	0.00	0.00	0.00	0.00	0.05	0.00	2.78	0.00	0.00	80.00	8.94	1.00	0.11	0.05	0.20	2.75	8.00
bel	110.62	21.02	3.05	0.71	1.00	0.45	0.00	0.00	0.00	0.00	0.05	0.00	2.90	0.00	0.00	79.00	8.89	1.00	0.11	0.05	0.20	2.86	7.96
dnk	125.73	23.89	3.60	1.39	1.01	0.49	13.07	0.69	2.24	7.18	0.05	0.05	3.43	5.56	0.78	82.75	9.73	2.63	0.23	0.06	0.21	3.40	8.81
fin	109.13	20.73	3.04	0.74	1.00	0.44	12.48	0.69	2.03	6.24	0.05	0.05	2.90	4.19	0.69	79.97	8.95	1.17	0.21	0.05	0.20	2.86	8.01
fra	103.32	19.63	2.94	0.72	1.02	0.43	12.88	0.69	1.98	6.92	0.05	0.05	2.71	3.73	0.62	83.69	9.87	3.09	0.24	0.05	0.21	2.77	8.94
deu	108.65	20.64	3.03	0.75	1.00	0.43	12.81	0.69	1.83	6.73	0.05	0.05	2.88	4.10	0.67	82.34	9.70	2.98	0.23	0.05	0.21	2.85	8.78
gbr	103.76	19.71	2.95	0.64	1.03	0.42	13.41	0.69	1.99	8.95	0.05	0.05	2.69	3.68	0.61	83.22	10.31	4.47	0.25	0.05	0.21	2.78	9.43
grc	101.75	19.33	2.91	0.57	1.03	0.41	13.29	0.69	1.59	7.47	0.05	0.05	2.68	3.61	0.61	85.31	10.90	4.70	0.27	0.05	0.21	2.75	10.03
irl	101.61	19.31	2.87	0.62	1.00	0.41	12.64	0.69	1.58	6.49	0.05	0.05	2.73	3.66	0.63	86.38	10.85	5.48	0.27	0.05	0.22	2.70	9.95
ita	101.19	19.23	2.87	0.53	1.01	0.41	12.75	0.69	1.74	6.96	0.05	0.05	2.69	3.63	0.62	81.20	9.42	2.50	0.22	0.05	0.20	2.70	8.50
lux	118.94	22.60	3.33	0.95	1.00	0.47	12.48	0.69	2.01	6.25	0.05	0.05	3.21	5.02	0.76	78.62	8.87	1.33	0.20	0.06	0.20	3.14	7.95
nld	131.94	25.07	4.37	2.36	1.01	0.54	12.56	0.70	2.64	6.37	0.05	0.05	4.23	7.50	0.87	85.26	10.08	3.30	0.25	0.06	0.21	4.19	9.14
prt	100.80	19.15	2.83	0.50	1.00	0.40	12.51	0.69	1.64	6.29	0.05	0.05	2.67	3.56	0.62	81.82	9.30	2.23	0.22	0.05	0.20	2.67	8.15
esp	102.63	19.50	2.89	0.50	1.00	0.42	12.48	0.69	1.84	6.25	0.05	0.05	2.73	3.75	0.64	78.98	8.91	1.44	0.20	0.05	0.20	2.72	7.99
swe	125.45	23.84	3.56	1.20	0.97	0.44	12.76	0.69	2.22	6.65	0.05	0.05	3.55	5.70	0.80	81.00	9.38	2.74	0.22	0.06	0.20	3.36	8.46
che	100.74	19.14	2.85	0.57	1.00	0.41	12.48	0.69	1.59	6.25	0.05	0.05	2.69	3.61	0.63	83.73	9.86	4.21	0.24	0.05	0.21	2.68	8.93
xef	126.82	24.10	4.37	2.44	1.00	0.51	12.52	0.70	2.52	6.32	0.05	0.05	4.27	7.54	0.87	83.05	9.38	2.08	0.22	0.06	0.21	4.20	8.41
alb	101.16	19.22	2.85	0.53	1.00	0.40	12.67	0.69	1.47	6.51	0.05	0.05	2.67	3.59	0.62	91.74	17.32	14.91	0.50	0.05	0.23	2.68	16.70
bgr	101.88	19.36	2.96	0.50	1.00	0.44	12.49	0.69	2.37	6.26	0.05	0.05	2.80	3.83	0.64	81.65	9.13	1.87	0.22	0.05	0.20	2.79	8.17
hrv	121.03	21.79	3.90	2.04	0.99	0.45	11.98	0.69	2.15	6.16	0.05	0.04	3.85	6.57	0.85	82.27	10.80	6.17	0.26	0.05	0.21	3.74	9.99
cyp	100.00	19.00	2.84	0.50	1.00	0.40	12.55	0.69	1.53	6.35	0.05	0.05	2.67	3.55	0.62	80.14	9.07	1.84	0.21	0.05	0.20	2.67	8.14
cze	100.23	19.04	2.83	0.52	1.00	0.40	12.50	0.69	1.57	6.28	0.05	0.05	2.67	3.56	0.62	104.48	25.37	23.69	0.94	0.05	0.26	2.67	24.83
hun	101.44	19.27	2.83	0.50	1.00	0.40	12.79	0.70	1.31	6.69	0.05	0.05	2.67	3.56	0.62	130.99	37.52	32.37	1.86	0.05	0.33	2.66	36.94
mlt	101.93	19.37	2.87	0.53	1.00	0.41	12.50	0.69	1.86	6.28	0.05	0.05	2.70	3.66	0.63	79.98	8.97	1.38	0.21	0.05	0.20	2.71	8.03
pol	101.94	19.37	2.89	0.51	1.01	0.41	13.12	0.69	1.99	7.20	0.05	0.05	2.70	3.65	0.62	89.67	11.97	6.08	0.31	0.05	0.22	2.73	11.10
rom	102.57	19.49	2.88	0.54	1.00	0.41	12.56	0.69	1.85	6.37	0.05	0.05	2.71	3.67	0.63								

RESULTS OBTAINED WITH THE L1 ADJUSTMENT DISTANCE

aus	100.81	19.15	2.87	0.52	1.01	0.41	12.65	0.69	1.73	6.53	0.05	0.05	2.69	3.64	0.62	81.70	9.27	2.27	0.22	0.05	0.20	2.71	8.32
nzl	102.39	19.45	2.91	0.60	1.01	0.42	12.57	0.69	1.87	6.38	0.05	0.05	2.73	3.74	0.64	79.67	9.00	1.76	0.21	0.05	0.20	2.74	8.07
chn	103.53	18.63	2.88	0.71	1.01	0.44	12.25	0.70	2.15	6.48	0.05	0.04	2.70	3.73	0.64	83.35	11.20	6.35	0.27	0.05	0.21	2.72	10.40
hkg	106.03	19.09	2.87	0.54	1.01	0.43	11.96	0.70	1.81	6.16	0.05	0.04	2.70	3.75	0.65	76.16	8.91	2.02	0.20	0.05	0.19	2.71	8.06
jpn	104.02	19.76	2.98	0.70	1.02	0.44	12.89	0.69	1.84	6.90	0.05	0.05	2.75	3.83	0.64	80.60	9.22	2.78	0.21	0.05	0.20	2.81	8.29
kor	109.76	20.85	3.09	0.80	1.01	0.47	12.60	0.69	2.30	6.43	0.05	0.05	2.89	4.23	0.68	93.07	16.60	13.93	0.47	0.05	0.23	2.90	15.93
twn	101.21	18.22	2.79	0.61	1.00	0.41	11.80	0.69	1.70	5.92	0.05	0.04	2.64	3.56	0.63	83.78	11.58	7.30	0.29	0.05	0.21	2.64	10.79
idn	103.71	19.70	2.96	0.79	1.01	0.44	12.65	0.69	1.84	6.57	0.05	0.05	2.78	3.89	0.65	80.87	9.15	2.13	0.21	0.05	0.20	2.79	8.21
mys	221.17	42.02	15.33	10.74	0.98	0.30	13.00	0.69	5.38	6.99	0.05	0.05	15.63	30.66	0.99	84.39	9.84	3.00	0.23	0.11	0.21	15.19	8.88
phl	100.01	19.00	2.85	0.50	1.00	0.40	12.55	0.70	1.51	6.35	0.05	0.05	2.69	3.60	0.62	84.54	9.99	3.88	0.24	0.05	0.21	2.68	9.05
sgp	104.48	18.81	2.82	0.50	1.00	0.42	11.80	0.69	1.63	5.91	0.05	0.04	2.67	3.66	0.64	417.18	342.24	342.13	102.59	0.05	1.04	2.65	341.61
tha	102.48	19.47	2.90	0.65	1.01	0.42	12.70	0.69	1.71	6.64	0.05	0.05	2.71	3.70	0.63	81.84	9.24	2.37	0.22	0.05	0.20	2.73	8.28
vnm	101.26	19.24	2.86	0.62	1.02	0.40	12.73	0.70	1.56	6.68	0.05	0.05	2.65	3.55	0.61	81.71	9.14	1.92	0.22	0.05	0.20	2.69	8.18
bgd	100.64	18.12	2.82	0.53	1.01	0.42	11.94	0.69	1.93	6.12	0.05	0.04	2.64	3.58	0.63	84.14	11.87	7.59	0.30	0.05	0.21	2.67	11.10
ind	100.28	19.05	2.89	0.51	1.00	0.42	12.56	0.69	1.98	6.36	0.05	0.05	2.72	3.70	0.63	83.42	10.06	4.73	0.24	0.05	0.21	2.72	9.15
lka	100.34	19.07	2.86	0.51	1.00	0.41	12.54	0.69	1.56	6.33	0.05	0.05	2.70	3.65	0.63	93.27	16.39	13.72	0.47	0.05	0.23	2.70	15.71
xsa	114.16	21.69	3.59	1.74	1.04	0.51	12.75	0.70	2.26	6.66	0.05	0.05	3.33	5.48	0.77	90.62	16.28	13.51	0.46	0.05	0.23	3.42	15.63
can	102.23	19.42	2.88	0.56	1.00	0.43	0.00	0.00	0.00	0.00	0.05	0.00	2.72	0.00	0.00	81.00	9.00	1.00	0.11	0.05	0.20	2.71	8.04
usa	100.47	19.09	2.86	0.50	1.00	0.41	12.57	0.69	1.82	6.37	0.05	0.05	2.71	3.64	0.63	82.04	9.70	3.56	0.23	0.05	0.21	2.70	8.79
mex	102.79	19.53	2.94	0.60	1.02	0.43	13.15	0.69	1.67	7.29	0.05	0.05	2.73	3.74	0.63	92.65	13.47	8.75	0.36	0.05	0.23	2.77	12.65
col	103.58	19.68	2.97	0.62	1.03	0.43	14.08	0.70	2.06	8.42	0.05	0.05	2.74	3.77	0.62	184.35	77.90	68.53	6.99	0.05	0.46	2.81	77.35
per	100.38	19.07	2.90	0.51	1.00	0.43	12.53	0.69	1.77	6.32	0.05	0.05	2.73	3.74	0.64	81.24	9.27	2.62	0.22	0.05	0.20	2.74	8.33
ven	100.87	19.17	2.90	0.58	1.00	0.42	12.63	0.69	1.92	6.47	0.05	0.05	2.73	3.71	0.63	83.62	9.56	2.60	0.23	0.05	0.21	2.73	8.60
xap	102.11	19.40	2.90	0.61	1.02	0.42	12.94	0.71	1.92	6.96	0.05	0.05	2.69	3.67	0.62	178.18	98.78	98.32	11.10	0.05	0.45	2.74	98.38
arg	101.30	19.25	2.90	0.60	1.00	0.42	13.11	0.71	1.93	7.14	0.05	0.05	2.73	3.73	0.64	766.92	675.73	675.59	306.84	0.05	1.92	2.73	674.64
bra	100.71	19.14	2.89	0.52	1.01	0.41	12.72	0.69	1.80	6.61	0.05	0.05	2.70	3.66	0.62	81.68	9.69	3.27	0.23	0.05	0.20	2.72	8.78
chl	114.28	21.71	3.21	0.76	0.99	0.44	13.00	0.69	2.21	7.00	0.05	0.05	3.10	4.65	0.73	86.82	10.85	5.35	0.27	0.05	0.20	3.02	9.94
ury	113.17	21.50	3.31	1.25	0.96	0.39	13.23	0.70	1.98	7.26	0.05	0.05	3.31	5.06	0.76	117.71	27.04	22.64	1.06	0.05	0.29	3.13	26.40
xsm	100.85	19.16	2.86	0.57	1.00	0.41	12.89	0.70	1.68	6.81	0.05	0.05	2.70	3.62	0.63	109.83	18.86	9.47	0.60	0.05	0.27	2.69	18.05
aut	106.46	20.23	2.93	0.50	1.00	0.44	0.00	0.00	0.00	0.00	0.05	0.00	2.78	0.00	0.00	80.00	8.94	1.00	0.11	0.05	0.20	2.75	8.00
bel	110.62	21.02	3.05	0.71	1.00	0.45	0.00	0.00	0.00	0.00	0.05	0.00	2.90	0.00	0.00	79.00	8.89	1.00	0.11	0.05	0.20	2.86	7.96
dnk	124.31	23.62	3.56	1.10	1.00	0.49	12.52	0.69	2.36	6.30	0.05	0.05	3.43	5.58	0.79	79.65	9.04	1.82	0.21	0.06	0.20	3.35	8.12
fin	109.13	20.73	3.02	0.65	0.99	0.44	12.52	0.69	1.96	6.30	0.05	0.05	2.90	4.16	0.69	80.23	9.04	1.69	0.21	0.05	0.20	2.84	8.10
fra	101.70	19.32	2.89	0.51	1.01	0.42	12.59	0.69	1.87	6.40	0.05	0.05	2.71	3.69	0.63	80.51	9.16	1.75	0.21	0.05	0.20	2.72	8.23
deu	108.64	20.64	3.03	0.75	1.00	0.44	12.49	0.69	2.05	6.26	0.05	0.05	2.88	4.16	0.68	79.59	8.93	1.25	0.21	0.05	0.20	2.85	7.99
gbr	100.72	19.14	2.85	0.50	1.00	0.40	12.53	0.69	1.81	6.31	0.05	0.05	2.69	3.61	0.62	80.24	9.15	1.90	0.21	0.05	0.20	2.68	8.23
grc	101.17	19.22	2.87	0.50	1.01	0.41	12.77	0.69	1.53	6.72	0.05	0.05	2.68	3.60	0.62	79.86	9.25	2.59	0.21	0.05	0.20	2.70	8.34
irl	101.84	19.35	2.87	0.62	1.00	0.41	12.63	0.69	1.58	6.51	0.05	0.05	2.70	3.67	0.63	84.97	10.22	4.46	0.25	0.05	0.21	2.71	9.30
ita	100.28	19.05	2.86	0.53	1.00	0.41	12.64	0.69	1.81	6.47	0.05	0.05	2.69	3.61	0.62	82.06	9.64	3.57	0.23	0.05	0.21	2.70	8.72
lux	118.94	22.60	3.34	0.98	1.00	0.47	12.49	0.69	2.00	6.26	0.05	0.05	3.21	5.03	0.76	78.89	8.94	1.66	0.21	0.06	0.20	3.14	8.02
nld	131.94	25.07	4.37	2.36	1.01	0.54	12.60	0.70	2.63	6.42	0.05	0.05	4.23	7.49	0.87	86.06	10.36	3.92	0.25	0.06	0.22	4.18	9.42
prt	100.80	19.15	2.83	0.50	1.00	0.40	12.52	0.69	1.62	6.30	0.05	0.05	2.67	3.55	0.62	81.73	9.30	2.20	0.22	0.05	0.20	2.67	8.36
esp	102.76	19.52	2.91	0.51	1.00	0.42	12.52	0.69	1.91	6.30	0.05	0.05	2.73	3.76	0.64	78.83	8.92	1.39	0.20	0.05	0.20	2.74	8.01
swe	125.46	23.84	3.57	1.20	0.97	0.43	13.01	0.69	2.12	7.00	0.05	0.05	3.55	5.66	0.79	83.16	9.76	3.00	0.23	0.06	0.21	3.36	8.83
che	100.74	19.14	2.85	0.57	1.00	0.41	12.53	0.69	1.65	6.31	0.05	0.05	2.69	3.61	0.62	84.60	9.94	3.84	0.24	0.05	0.21	2.68	8.99
xef	126.91	24.11	4.40	2.49	1.01	0.52	12.76	0.70	2.60	6.68	0.05	0.05	4.27	7.57	0.87	84.90	10.24	3.67	0.25	0.06	0.21	4.24	9.31
alb	101.21	19.23	2.84	0.53	1.00	0.40	12.65	0.69	1.45	6.49	0.05	0.05	2.67	3.58	0.62	92.05	16.61	14.05	0.47	0.05	0.23	2.67	15.96
bgr	101.88	19.36	2.97	0.50	1.00	0.45	12.50	0.69	2.48	6.28	0.05	0.05	2.80	3.84	0.64	81.77	9.15	1.76	0.22	0.05	0.20	2.80	8.19
hrv	121.05	21.79	3.77	1.89	0.95	0.37	12.31	0.69	2.04	6.62	0.05	0.04	3.85	6.37	0.84	85.86	12.10	7.66	0.30	0.05	0.21	3.60	11.31
cyp	102.04	19.39	2.87	0.51	1.01	0.41	12.97	0.70	1.48	7.06	0.05	0.05	2.67	3.58	0.61	83.53	9.68	2.81	0.23	0.05	0.21	2.70	8.74
cze	100.23	19.04	2.83	0.52	1.00	0.40	12.49	0.69	1.57	6.26	0.05	0.05	2.67	3.56	0.62	103.44	24.82	23.14	0.90	0.05	0.26	2.67	24.28
hun	101.36	19.26	2.82	0.50	1.00	0.39	12.95	0.71	1.35	6.88	0.05	0.05	2.67	3.54	0.62	378.16	257.83	255.75	60.76	0.05	0.95	2.65	257.13
mlt	101.93	19.37	2.88	0.58	1.00	0.41	12.57	0.69	1.88	6.39	0.05	0.05	2.70	3.66	0.63	82.50	9.35	1.78	0.22	0.05	0.21	2.71	8.39
pol	102.44	19.46	2.90	0.51	1.01	0.42	13.27	0.69	2.05	7.42	0.05	0.05	2.70	3.65	0.62	92.25	13.59	8.96	0.36	0.05	0.23	2.73	12.78
rom	102.57	19.49	2.90	0.61	1.01	0.41	12.68	0.69	1.95	6.55	0.05	0.05	2.71	3.69	0.63	84.06	9.						

RESULTS OBTAINED WITH THE LIMMAX ADJUSTMENT DISTANCE

aus	100.83	19.16	2.87	0.52	1.01	0.41	12.66	0.69	1.74	6.55	0.05	0.05	2.69	3.64	0.62	81.96	9.33	2.41	0.22	0.05	0.20	2.71	8.38
nzl	102.39	19.45	2.91	0.60	1.01	0.42	12.56	0.69	1.87	6.37	0.05	0.05	2.73	3.74	0.64	79.67	9.00	1.74	0.21	0.05	0.20	2.74	8.07
chn	102.65	18.48	2.85	0.71	1.00	0.43	12.03	0.69	2.04	6.25	0.05	0.04	2.70	3.70	0.64	81.47	10.50	5.31	0.25	0.05	0.20	2.69	9.68
hkg	106.04	19.09	2.87	0.53	1.01	0.43	11.94	0.70	1.80	6.13	0.05	0.04	2.70	3.74	0.65	76.13	8.89	1.98	0.20	0.05	0.19	2.70	8.03
jpn	103.90	19.74	2.97	0.68	1.02	0.44	12.87	0.69	1.84	6.87	0.05	0.05	2.75	3.83	0.64	80.54	9.20	2.74	0.21	0.05	0.20	2.80	8.28
kor	109.73	20.85	3.08	0.79	1.01	0.47	12.59	0.69	2.30	6.42	0.05	0.05	2.89	4.22	0.68	94.76	18.13	15.74	0.54	0.05	0.24	2.90	17.50
twn	101.21	18.22	2.79	0.61	1.00	0.41	11.80	0.69	1.70	5.92	0.05	0.04	2.64	3.56	0.63	83.73	11.55	7.27	0.29	0.05	0.21	2.64	10.77
idn	103.73	19.71	2.96	0.79	1.01	0.44	12.66	0.69	1.84	6.59	0.05	0.05	2.78	3.89	0.65	80.87	9.16	2.16	0.21	0.05	0.20	2.79	8.22
mys	221.17	42.02	15.33	10.74	0.98	0.30	12.97	0.69	5.39	6.95	0.05	0.05	15.63	30.66	0.99	84.24	9.80	2.99	0.23	0.11	0.21	15.19	8.85
phl	100.01	19.00	2.85	0.50	1.00	0.40	12.55	0.70	1.51	6.35	0.05	0.05	2.69	3.60	0.62	84.55	9.99	3.87	0.24	0.05	0.21	2.68	9.05
sgp	104.48	18.81	2.82	0.50	1.00	0.42	11.80	0.69	1.63	5.91	0.05	0.04	2.67	3.66	0.64	418.87	343.94	343.83	103.46	0.05	1.05	2.65	343.30
tha	102.48	19.47	2.90	0.65	1.01	0.42	12.70	0.69	1.71	6.64	0.05	0.05	2.71	3.70	0.63	81.83	9.24	2.37	0.22	0.05	0.20	2.73	8.28
vnm	101.26	19.24	2.86	0.62	1.02	0.40	12.73	0.70	1.56	6.68	0.05	0.05	2.65	3.55	0.61	81.71	9.14	1.92	0.22	0.05	0.20	2.69	8.18
bgd	100.64	18.12	2.82	0.53	1.01	0.42	11.94	0.69	1.93	6.12	0.05	0.04	2.64	3.58	0.63	84.20	11.89	7.59	0.30	0.05	0.21	2.67	11.12
ind	100.28	19.05	2.89	0.51	1.00	0.42	12.55	0.69	1.98	6.34	0.05	0.05	2.72	3.70	0.63	83.04	9.86	4.28	0.24	0.05	0.21	2.72	8.94
lka	100.35	19.07	2.86	0.51	1.00	0.41	12.54	0.69	1.56	6.33	0.05	0.05	2.70	3.65	0.63	93.28	16.39	13.72	0.47	0.05	0.23	2.70	15.71
xsa	114.17	21.69	3.59	1.74	1.03	0.51	12.72	0.70	2.28	6.61	0.05	0.05	3.33	5.48	0.77	92.56	16.83	14.14	0.48	0.05	0.23	3.42	16.18
can	102.23	19.42	2.88	0.56	1.00	0.43	0.00	0.00	0.00	0.00	0.05	0.00	2.72	0.00	0.00	81.00	9.00	1.00	0.11	0.05	0.20	2.71	8.04
usa	100.47	19.09	2.86	0.50	1.00	0.41	12.57	0.69	1.82	6.37	0.05	0.05	2.71	3.64	0.63	82.05	9.70	3.56	0.23	0.05	0.21	2.70	8.79
mex	102.92	19.56	2.94	0.60	1.02	0.43	13.18	0.69	1.68	7.34	0.05	0.05	2.73	3.74	0.63	92.98	13.62	8.95	0.36	0.05	0.23	2.77	12.80
col	103.56	19.68	2.97	0.61	1.02	0.43	14.06	0.70	2.07	8.39	0.05	0.05	2.74	3.77	0.62	184.40	77.96	68.58	7.00	0.05	0.46	2.80	77.41
per	100.38	19.07	2.90	0.51	1.00	0.41	12.53	0.69	1.77	6.33	0.05	0.05	2.73	3.74	0.64	81.26	9.27	2.65	0.22	0.05	0.20	2.74	8.34
ven	100.87	19.17	2.90	0.58	1.00	0.42	12.63	0.69	1.92	6.47	0.05	0.05	2.73	3.71	0.63	83.60	9.55	2.60	0.23	0.05	0.21	2.73	8.59
xap	102.12	19.40	2.90	0.61	1.02	0.42	12.94	0.71	1.92	6.96	0.05	0.05	2.69	3.67	0.62	178.36	98.78	98.32	11.10	0.05	0.45	2.74	98.38
arg	101.29	19.25	2.90	0.60	1.00	0.42	13.11	0.71	1.92	7.14	0.05	0.05	2.73	3.73	0.64	769.11	676.49	676.32	307.07	0.05	1.92	2.73	675.39
bra	100.71	19.14	2.89	0.52	1.01	0.41	12.74	0.69	1.81	6.63	0.05	0.05	2.70	3.66	0.62	81.83	9.75	3.45	0.23	0.05	0.20	2.72	8.85
chl	114.00	21.66	3.21	0.77	0.99	0.44	12.90	0.69	2.21	6.85	0.05	0.05	3.10	4.66	0.73	85.84	10.52	4.81	0.26	0.05	0.21	3.02	9.61
ury	113.17	21.50	3.31	1.25	0.96	0.39	13.23	0.70	1.98	7.26	0.05	0.05	3.31	5.06	0.76	117.31	26.93	22.66	1.05	0.05	0.29	3.14	26.29
xsm	100.85	19.16	2.86	0.57	1.00	0.41	12.85	0.70	1.67	6.75	0.05	0.05	2.70	3.62	0.63	109.17	18.61	9.47	0.59	0.05	0.27	2.69	17.79
aut	106.46	20.23	2.93	0.50	1.00	0.44	0.00	0.00	0.00	0.00	0.05	0.00	2.78	0.00	0.00	80.00	8.94	1.00	0.11	0.05	0.20	2.75	8.00
bel	110.62	21.02	3.05	0.71	1.00	0.45	0.00	0.00	0.00	0.00	0.05	0.00	2.90	0.00	0.00	79.00	8.89	1.00	0.11	0.05	0.20	2.86	7.96
dnk	124.31	23.62	3.56	1.10	1.00	0.49	12.51	0.69	2.36	6.30	0.05	0.05	3.43	5.58	0.79	79.71	9.05	1.88	0.21	0.06	0.20	3.35	8.12
fin	109.13	20.73	3.02	0.65	0.99	0.44	12.52	0.69	1.96	6.30	0.05	0.05	2.90	4.16	0.69	80.10	9.03	1.70	0.21	0.05	0.20	2.84	8.09
fra	101.70	19.32	2.89	0.51	1.01	0.42	12.58	0.69	1.87	6.39	0.05	0.05	2.71	3.69	0.63	80.80	9.21	1.99	0.22	0.05	0.20	2.72	8.28
deu	108.64	20.64	3.04	0.75	1.00	0.44	12.49	0.69	2.05	6.26	0.05	0.05	2.88	4.16	0.68	79.62	8.93	1.25	0.21	0.05	0.20	2.86	8.00
gbr	100.72	19.14	2.85	0.50	1.00	0.41	12.52	0.69	1.81	6.31	0.05	0.05	2.69	3.61	0.62	80.12	9.11	1.89	0.21	0.05	0.20	2.69	8.18
grc	101.17	19.22	2.87	0.50	1.01	0.41	12.77	0.69	1.53	6.72	0.05	0.05	2.68	3.60	0.62	79.86	9.25	2.59	0.21	0.05	0.20	2.70	8.34
irl	101.85	19.35	2.87	0.62	1.00	0.41	12.63	0.69	1.58	6.51	0.05	0.05	2.70	3.67	0.63	84.92	10.20	4.41	0.25	0.05	0.21	2.71	9.27
ita	100.28	19.05	2.86	0.53	1.00	0.41	12.63	0.69	1.81	6.45	0.05	0.05	2.69	3.61	0.62	82.06	9.60	3.48	0.23	0.05	0.21	2.69	8.68
lux	118.94	22.60	3.34	0.98	1.00	0.47	12.49	0.69	2.01	6.26	0.05	0.05	3.21	5.03	0.76	78.90	8.93	1.63	0.21	0.06	0.20	3.14	8.02
nld	131.94	25.07	4.37	2.35	1.01	0.54	12.60	0.70	2.63	6.42	0.05	0.05	4.23	7.49	0.87	86.11	10.37	3.91	0.26	0.06	0.22	4.18	9.43
prt	100.80	19.15	2.83	0.50	1.00	0.40	12.52	0.69	1.62	6.30	0.05	0.05	2.67	3.55	0.62	81.73	9.30	2.20	0.22	0.05	0.20	2.67	8.36
esp	102.76	19.52	2.91	0.51	1.00	0.42	12.52	0.69	1.91	6.30	0.05	0.05	2.73	3.76	0.64	78.82	8.92	1.39	0.20	0.05	0.20	2.74	8.00
swe	125.46	23.84	3.57	1.20	0.97	0.43	13.00	0.69	2.12	7.00	0.05	0.05	3.55	5.66	0.79	83.15	9.76	3.00	0.23	0.06	0.21	3.36	8.83
che	100.74	19.14	2.85	0.57	1.00	0.41	12.52	0.69	1.64	6.29	0.05	0.05	2.69	3.61	0.62	84.46	9.89	3.83	0.24	0.05	0.21	2.68	8.94
xsf	126.97	24.12	4.42	2.50	1.01	0.52	12.79	0.70	2.60	6.73	0.05	0.05	4.27	7.58	0.87	84.99	10.32	3.80	0.25	0.06	0.21	4.25	9.40
alb	101.21	19.23	2.84	0.53	1.00	0.40	12.65	0.69	1.45	6.48	0.05	0.05	2.67	3.58	0.62	92.04	16.60	14.05	0.47	0.05	0.23	2.67	15.95
bgr	101.88	19.36	2.97	0.50	1.00	0.45	12.50	0.69	2.48	6.28	0.05	0.05	2.80	3.84	0.64	81.77	9.15	1.76	0.22	0.05	0.20	2.80	8.19
hrv	121.05	21.79	3.77	1.89	0.95	0.37	12.30	0.69	2.04	6.61	0.05	0.04	3.85	6.38	0.84	85.76	12.09	7.67	0.30	0.05	0.21	3.61	11.31
cyp	101.59	19.30	2.87	0.51	1.01	0.41	12.90	0.69	1.49	6.95	0.05	0.05	2.67	3.58	0.61	82.65	9.57	2.77	0.23	0.05	0.21	2.70	8.63
cze	100.23	19.04	2.83	0.52	1.00	0.40	12.49	0.69	1.57	6.26	0.05	0.05	2.67	3.56	0.62	103.44	24.82	23.13	0.90	0.05	0.26	2.67	24.28
hun	101.36	19.26	2.83	0.50	1.00	0.40	12.75	0.70	1.33	6.63	0.05	0.05	2.67	3.55	0.62	125.23	33.36	28.76	1.51	0.05	0.31	2.66	32.77
mlt	101.93	19.37	2.88	0.58	1.00	0.41	12.58	0.69	1.88	6.39	0.05	0.05	2.70	3.66	0.63	82.47	9.35	1.78	0.22	0.05	0.21	2.71	8.39
pol	102.44	19.46	2.90	0.51	1.01	0.42	13.26	0.69	2.04	7.41	0.05	0.05	2.70	3.65	0.62	92.17	13.56	8.93	0.36	0.05	0.23	2.73	12.75
rom	102.57	19.49	2.90	0.61	1.01	0.41	12.68	0.69	1.95	6.55	0.05	0.05	2.71	3.69	0.63	84.05	9.73						

RESULTS OBTAINED WITH THE RAS ADJUSTMENT DISTANCE

aus	101.59	19.30	2.89	0.52	1.01	0.42	12.84	0.69	1.74	6.69	0.05	0.05	2.69	3.65	0.62	81.84	9.37	2.69	0.22	0.05	0.20	2.72	8.43
nzl	102.48	19.47	2.93	0.60	1.01	0.43	12.70	0.69	1.85	6.58	0.05	0.05	2.73	3.76	0.63	79.89	9.13	2.23	0.21	0.05	0.20	2.76	8.21
chn	107.59	19.37	3.00	0.88	1.06	0.45	14.04	0.69	2.77	8.62	0.05	0.04	2.70	3.79	0.62	99.66	19.88	16.03	0.63	0.05	0.25	2.84	19.25
hkg	106.04	19.09	2.88	0.59	1.01	0.43	11.99	0.69	1.79	6.20	0.05	0.04	2.70	3.75	0.65	76.03	8.93	1.97	0.20	0.05	0.19	2.71	8.08
jpn	104.60	19.87	2.99	0.75	1.03	0.45	13.01	0.69	1.84	7.14	0.05	0.05	2.75	3.84	0.63	81.23	9.32	3.00	0.22	0.05	0.20	2.82	8.39
kor	109.73	20.85	3.04	0.57	1.00	0.46	12.49	0.69	2.19	6.26	0.05	0.05	2.89	4.18	0.69	82.83	9.61	3.66	0.23	0.05	0.21	2.86	8.67
twn	101.21	18.22	2.79	0.61	1.00	0.41	11.81	0.69	1.69	5.92	0.05	0.04	2.64	3.56	0.63	83.73	11.57	7.19	0.29	0.05	0.21	2.64	10.79
idn	103.67	19.70	2.96	0.79	1.01	0.44	12.67	0.69	1.84	6.59	0.05	0.05	2.78	3.89	0.65	81.07	9.22	2.14	0.22	0.05	0.20	2.79	8.28
mys	221.17	42.02	15.33	10.74	0.98	0.30	12.99	0.69	5.37	6.98	0.05	0.05	15.63	30.66	0.99	84.39	9.83	3.00	0.23	0.11	0.21	15.19	8.88
phl	100.01	19.00	2.86	0.50	1.00	0.41	12.58	0.70	1.58	6.40	0.05	0.05	2.69	3.62	0.62	84.18	9.95	3.95	0.24	0.05	0.21	2.70	9.02
sgp	104.48	18.81	2.82	0.50	1.00	0.42	11.81	0.69	1.64	5.92	0.05	0.04	2.67	3.66	0.64	413.81	338.69	338.58	100.78	0.05	1.03	2.66	338.06
tha	102.47	19.47	2.90	0.65	1.01	0.42	12.73	0.69	1.71	6.98	0.05	0.05	2.71	3.70	0.63	82.02	9.33	2.74	0.22	0.05	0.21	2.73	8.38
vnm	101.27	19.24	2.86	0.62	1.02	0.40	12.74	0.70	1.55	6.71	0.05	0.05	2.65	3.55	0.61	81.54	9.14	1.92	0.22	0.05	0.20	2.70	8.19
bgd	100.64	18.12	2.81	0.50	1.01	0.42	11.90	0.69	1.91	6.07	0.05	0.04	2.64	3.57	0.63	83.15	11.66	7.54	0.29	0.05	0.21	2.66	10.90
ind	100.37	19.07	2.89	0.51	1.00	0.42	12.75	0.69	2.00	6.61	0.05	0.05	2.72	3.70	0.63	87.45	12.73	9.10	0.32	0.05	0.22	2.73	11.96
lka	100.30	19.06	2.86	0.51	1.00	0.41	12.54	0.69	1.56	6.33	0.05	0.05	2.70	3.65	0.63	93.15	16.32	13.64	0.46	0.05	0.23	2.70	15.64
xsa	114.21	21.70	3.40	1.24	0.98	0.44	12.78	0.69	2.02	6.70	0.05	0.05	3.33	5.22	0.77	85.32	11.45	6.85	0.28	0.05	0.21	3.23	10.63
can	102.23	19.42	2.88	0.56	1.00	0.43	0.00	0.00	0.00	0.00	0.05	0.00	2.72	0.00	0.00	81.00	9.00	1.00	0.11	0.05	0.20	2.71	8.04
usa	100.47	19.09	2.86	0.50	1.00	0.41	12.57	0.69	1.84	6.37	0.05	0.05	2.71	3.64	0.63	82.29	9.76	3.78	0.23	0.05	0.21	2.70	8.85
mex	100.82	19.15	2.89	0.57	1.00	0.42	12.65	0.69	1.79	6.48	0.05	0.05	2.73	3.71	0.64	84.76	9.95	3.88	0.24	0.05	0.21	2.72	9.00
col	104.26	19.81	3.00	0.69	1.03	0.43	14.28	0.70	2.06	8.71	0.05	0.05	2.74	3.62	0.62	184.20	77.20	66.88	6.88	0.05	0.46	2.83	76.64
per	100.38	19.07	2.90	0.51	1.00	0.43	12.53	0.69	1.79	6.32	0.05	0.05	2.73	3.74	0.64	81.19	9.28	2.66	0.22	0.05	0.20	2.74	8.34
ven	100.87	19.17	2.89	0.58	1.00	0.42	12.61	0.69	1.92	6.44	0.05	0.05	2.73	3.71	0.63	84.15	9.61	2.47	0.23	0.05	0.21	2.73	8.64
xap	102.04	19.39	2.90	0.59	1.02	0.42	12.95	0.70	1.96	6.97	0.05	0.05	2.69	3.67	0.62	175.94	97.19	96.74	10.78	0.05	0.44	2.74	96.79
arg	102.86	19.54	2.94	0.60	1.02	0.43	13.42	0.70	2.02	7.67	0.05	0.05	2.73	3.76	0.63	758.37	672.17	672.07	305.72	0.05	1.90	2.77	671.10
bra	100.72	19.14	2.89	0.54	1.01	0.41	12.73	0.69	1.79	6.62	0.05	0.05	2.70	3.66	0.62	81.74	9.66	3.10	0.23	0.05	0.20	2.73	8.76
chl	114.23	21.70	3.20	0.72	0.99	0.45	12.89	0.69	2.24	6.83	0.05	0.05	3.10	4.66	0.73	85.42	10.65	5.30	0.26	0.05	0.21	3.01	9.76
ury	113.17	21.50	3.31	1.25	0.96	0.39	13.24	0.70	1.99	7.26	0.05	0.05	3.31	5.06	0.76	118.41	26.98	22.21	1.05	0.05	0.30	3.13	26.32
xsm	101.50	19.29	2.88	0.57	1.01	0.41	13.20	0.70	1.73	7.28	0.05	0.05	2.70	3.64	0.62	116.84	21.82	11.79	0.76	0.05	0.20	2.72	21.02
aut	106.46	20.23	2.93	0.50	1.00	0.44	0.00	0.00	0.00	0.00	0.05	0.00	2.78	0.00	0.00	80.00	8.94	1.00	0.11	0.05	0.20	2.75	8.00
bel	110.62	21.02	3.05	0.71	1.00	0.45	0.00	0.00	0.00	0.00	0.05	0.00	2.90	0.00	0.00	79.00	8.89	1.00	0.11	0.05	0.20	2.86	7.96
dnk	126.74	24.08	3.65	1.48	1.03	0.50	13.45	0.70	2.23	7.99	0.05	0.05	3.43	5.58	0.77	84.23	10.07	2.96	0.24	0.06	0.21	3.45	9.15
fin	109.13	20.73	3.05	0.77	1.00	0.45	12.48	0.69	2.05	6.25	0.05	0.05	2.90	4.20	0.69	80.30	9.00	1.27	0.21	0.05	0.20	2.87	8.05
fra	101.70	19.32	2.89	0.51	1.01	0.42	12.57	0.69	1.86	6.38	0.05	0.05	2.71	3.69	0.63	80.46	9.17	1.92	0.21	0.05	0.20	2.72	8.24
deu	108.64	20.64	3.03	0.71	1.00	0.44	12.48	0.69	2.04	6.25	0.05	0.05	2.88	4.16	0.68	79.22	8.89	1.20	0.21	0.05	0.20	2.85	7.96
gbr	102.46	19.47	2.93	0.66	1.03	0.42	13.06	0.69	1.85	7.62	0.05	0.05	2.69	3.68	0.62	81.31	9.52	2.65	0.22	0.05	0.20	2.76	8.60
grc	101.16	19.22	2.87	0.50	1.01	0.41	12.80	0.69	1.53	6.76	0.05	0.05	2.68	3.60	0.62	80.44	9.39	2.81	0.22	0.05	0.20	2.70	8.49
irl	101.88	19.36	2.88	0.62	1.00	0.41	12.65	0.69	1.58	6.54	0.05	0.05	2.70	3.67	0.63	84.73	10.01	3.77	0.24	0.05	0.21	2.71	9.07
ita	101.20	19.23	2.89	0.53	1.01	0.42	12.76	0.69	1.72	6.55	0.05	0.05	2.69	3.65	0.62	79.09	9.05	1.78	0.21	0.05	0.20	2.72	8.14
lux	118.94	22.60	3.33	0.93	1.00	0.47	12.49	0.69	1.99	6.26	0.05	0.05	3.21	5.01	0.76	78.91	8.90	1.35	0.20	0.06	0.20	3.13	7.98
nld	131.94	25.07	4.33	2.29	1.00	0.52	12.59	0.70	2.59	6.40	0.05	0.05	4.23	7.45	0.87	86.30	10.45	4.03	0.26	0.06	0.22	4.15	9.52
prt	100.80	19.15	2.83	0.50	1.00	0.40	12.52	0.69	1.63	6.30	0.05	0.05	2.67	3.56	0.62	81.72	9.29	2.20	0.22	0.05	0.20	2.67	8.34
esp	102.74	19.52	2.90	0.50	1.00	0.42	12.51	0.69	1.89	6.29	0.05	0.05	2.73	3.76	0.64	78.67	8.90	1.33	0.20	0.05	0.20	2.73	7.98
swe	125.46	23.84	3.56	1.20	0.97	0.44	12.83	0.69	2.19	6.75	0.05	0.05	3.55	5.68	0.80	81.52	9.47	2.95	0.22	0.06	0.20	3.35	8.55
che	101.45	19.28	2.87	0.57	1.01	0.41	12.66	0.69	1.60	6.55	0.05	0.05	2.69	3.63	0.62	83.92	9.91	3.76	0.24	0.05	0.21	2.70	8.98
xef	128.44	24.40	4.38	2.36	1.00	0.51	13.02	0.70	2.53	6.86	0.05	0.05	4.27	7.54	0.87	83.13	9.60	2.23	0.23	0.06	0.21	4.21	8.65
alb	101.22	19.23	2.84	0.53	1.00	0.40	12.65	0.69	1.45	6.50	0.05	0.05	2.67	3.58	0.62	92.65	16.50	13.87	0.47	0.05	0.23	2.68	15.83
bgd	101.88	19.36	2.96	0.50	1.00	0.44	12.54	0.69	2.33	6.33	0.05	0.05	2.80	3.83	0.64	81.21	9.14	1.76	0.21	0.05	0.20	2.80	8.19
hrv	121.06	21.79	3.77	1.89	0.95	0.37	12.29	0.69	2.03	6.59	0.05	0.04	3.85	6.37	0.84	85.86	11.93	7.38	0.30	0.05	0.21	3.60	11.13
cyp	101.97	19.37	2.88	0.51	1.02	0.41	12.96	0.70	1.48	7.02	0.05	0.05	2.67	3.58	0.61	82.66	9.59	3.08	0.23	0.05	0.21	2.71	8.66
cze	100.23	19.04	2.83	0.52	1.00	0.40	12.49	0.69	1.57	6.26	0.05	0.05	2.67	3.56	0.62	103.42	24.73	23.03	0.90	0.05	0.26	2.67	24.19
hun	101.36	19.26	2.83	0.50	1.00	0.40	12.75	0.70	1.33	6.23	0.05	0.05	2.67	3.55	0.62	124.39	32.43	27.82	1.44	0.05	0.31	2.66	31.83
mlt	101.93	19.37	2.86	0.50	1.00	0.41	12.50	0.69	1.75	6.28	0.05	0.05	2.70	3.64	0.63	81.96	9.21	1.75	0.22	0.05	0.20	2.69	8.25
pol	102.36	19.45	2.91	0.51	1.01	0.42	13.04	0.69	1.88	7.05	0.05	0.05	2.70	3.67	0.62	84.91	10.65	5.69	0.26	0.05	0.21	2.74	9.76
rom	102.57	19.49	2.87	0.50	1.00	0.41	12.48	0.69	1.74	6.25	0.05	0.05	2.71	3.66	0.63	81.71	9.11	1.55					