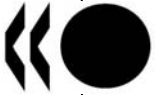


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COMPARING TRADE DATA ESTIMATION PROCEDURES

Note by UNSD

4TH INTERNATIONAL TRADE STATISTICS EXPERT MEETING

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COMPARING TRADE DATA ESTIMATION PROCEDURES

Note by UNSD

1. For the purpose of calculating world exports of commodities or constructing trade time series for poorly reporting countries it is often necessary to estimate missing data. The focus of this note is on the estimation of commodity export statistics¹ for filling data gaps rather than for forecasting. In those cases certain trade information can be known, such as a country's total exports, mirror imports or all commodity export values of available reporting countries in the United Nations trade database (Comtrade). Two methods of estimation are compared, namely (a) extrapolation of previously reported data and (b) estimation by use of mirror statistics as reported by the trading partners. Estimation by use of mirror statistics is nowadays widely used because of the ease with which data can be manipulated. Little is known however about how good or bad the mirror statistics are compared to other methods of estimation.

2. In the preparation of the United Nations International Trade Statistics Yearbook a combination of extrapolation and mirror statistics is used to estimate commodity statistics for countries or areas which did not report for a particular year. Specifically, extrapolation is used for two years before or after a year, for which a country reported its data. For years which are further away in time from any reported data the method of relative use of mirror statistics (see explanation below) is applied. This way of working was viewed as limiting the risk of creating unreasonable estimates. However, proof for this approach was rather scarce.

3. The extrapolation method in its simple form uses a fixed inflation or deflation rate for all commodities based on the growth or decline of the total trade of the country in question. A slightly more sophisticated method - also shown below - uses a variety of growth rates based on average world growth rate per commodity. This method can be refined by using growth rates based on regional trends.

Description of the estimation methods

4. The two main estimation methodologies presented here are mirror statistics and extrapolation. For mirror statistics two versions are tested and for extrapolation three.

(i) Mirror statistics

- a) Direct use of mirror statistics; for a given commodity the sum of the import values of the trading partners is taken as the estimate of the export value.
- b) Relative use of mirror statistics with known total exports of the country; export values are estimated for all 3-digit commodities as under (i)a. These estimated export values are then inflated (or deflated) to reach the known total export value for the year of estimation.

(ii) Extrapolation

¹ Commodity export not broken down by partner, but to the World only

- a) General growth rate; the ratio of the total exports of the year of estimation (T1) to the last reported year – the base year (T0) - is taken as the multiplier for each commodity value of the base year to calculate the estimates.
- b) World2 commodity growth rate; increase (or decrease) in world export value of a certain commodity reflects the combination of fluctuation in commodity price and trade volume; therefore, the ratio of the world commodity export value of the year of estimation to the base year is taken as the multiplier for the commodity value of the base year to calculate the estimates; these values are then deflated or inflated to reach the known total export value of the year of estimation³.
- c) Regional⁴ commodity growth rate; this method is identical to (ii)b. except that regional values are used instead of world values; for instance for Lebanon the region of the Middle East will be used.

5. The question addressed in this note is which method gives better estimates. There are many different ways in which this question could be answered. Some important considerations for good estimates are (a) share of the main commodities, (b) rank order of the main commodities and (c) the deviation between estimated and reported values. The comparisons hereafter use measures for these three considerations. It is thought that the chosen measures give well interpretable results, but other measures are possible.

6. Over the last year UNSD received from the Bahamas, Burundi, Ethiopia, French Polynesia, Lebanon, Malawi and Ukraine several recent years of trade statistics, which were previously missing from the UN Comtrade database. For these countries we had estimated in the past commodity trade statistics using both extrapolation and mirror statistics. Now that we received the reported data we can check how good or how bad the estimates for these countries actually have been. The rest of this note describes a comparison of the estimated and reported export values of 3-digit SITC Rev.2 commodities for Lebanon for the years 1998 to 2001.

Case Study: Estimates of Lebanon 1998-2001 commodity exports

7. Annex 1 shows the reported and estimated values of the main export commodities of Lebanon for the years 1998 to 2001. Main commodities are defined as the reported top 20 commodities. The annex gives 80 reported and 400 estimated values (4 years, 20 commodities and 5 estimation methods) which can be summarized in many different ways. As given in paragraph 5 the analyses here will concentrate on the share, the rank order and the deviation between reported and estimated values of the main commodities.

² World in this context is equivalent to all the available reported commodity export data in the United Nations Comtrade database.

³ Mathematically this can be expressed as

$$y_i = \left(\frac{w_{1i}}{w_{0i}} x_{0i} \right) * \frac{T_1}{\sum_i \left(\frac{w_{1i}}{w_{0i}} x_{0i} \right)}$$

where y is the estimated export value for commodity i , w_{1i} is the world export value of commodity i for year 1 (the year of estimation) and w_{0i} is the world export value of commodity i for year 0 (the base year), x_{0i} is the export value of commodity i for base year 0 and T_1 is the total exports of the year of estimation.

⁴ Regional values are (as in the case of World) dependent on availability of reported commodity export data in the Comtrade database.

Share of main commodities

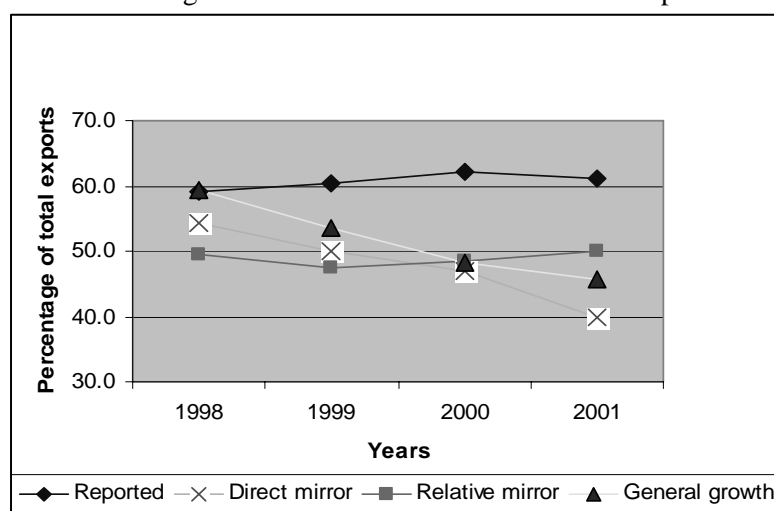
8. Table 1 shows the share of the top 20 export commodities in Lebanon’s reported trade and the share which is given by the 5 estimation methods for these same commodities. The denominator of the share is in all cases the reported total exports value of the given year. The year 1997, for which reported commodity export data of Lebanon were available, was taken as the base year for the extrapolation method.

Table 1
Percentage share of main commodities in total exports

	Reported	Estimation Method				
		Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
1998	59.1	54.2	49.5	59.4	59.5	61.0
1999	60.5	50.0	47.4	53.5	52.5	48.8
2000	62.0	46.9	48.5	48.3	47.1	46.2
2001	61.1	39.9	49.9	45.8	45.2	46.4

Table 1 tells us that the share of the top 20 export commodities of Lebanon is about 60% of the total exports for each of the years 1998 to 2001 based on reported data. The share of the estimated values of these same commodities is always lower than the actual share except for those generated by the extrapolation methods for the year 1998. In other words the values of top commodities are underestimated in this case. Further, the share of the estimates is decreasing from 1998 to 2001 except for the relative use of mirror statistics. The extrapolation methods underestimate the share of the top commodities more with each year that the estimates are further away from the base year. The decrease in the share of the estimates for the direct use of mirror statistics from 2000 to 2001 can be explained by the decrease in number of reporting countries or areas, namely a decrease from 139 to 113.

Graph 1
Percentage share of main commodities in total exports



Graph 1 illustrates the difference between the share of top commodities estimated by mirror statistics and extrapolation⁵. The estimation method of relative use of mirror statistics seems to be consistent over the years even though the share of top commodities is underestimated. In the case where a year adjacent to a reported year is estimated, extrapolation has given a very good estimate of this share. However, where there was a large gap in years between the base year and the year to be estimated the mirror statistics approach was better. The use of direct mirror statistics should be avoided if the number of reporting countries is small or decreasing.

Rank order of main commodities

9. The rank order of the top commodities is a second measure which can shed some more light on the differences between the estimation methods. Annex 2 gives a complete overview of the ranking of the commodity values as estimated by each of the 5 methods for each of the 4 years. It shows the rank number of a commodity in the estimated data in the order of the reported data. For instance, the 1998 table of Annex 2 shows that “Aluminum” ranks 4th in the reported data and that the mirror statistics rank it at the 11th position. Some noticeable figures are: (a) In the 1999 table the reported rank of commodity “Gold, non-monetary” is number 2 but the mirror statistics only ranked it at position 202 (out of 224 export commodities); (b) Less evident to notice are the missing rank numbers in the estimated data. For instance, the 1998 table does not show rank number 1 for the mirror statistics. Commodity “Pearl, precious and semi-precious stones, unworked or worked” was estimated as the top commodity by the mirror statistics method, but was ranked only in the 88th spot in the reported data⁶.

10. By definition the direct mirror statistics and the relative mirror statistics have the same ranking of estimated commodities for any given year. The ranking of commodities of the extrapolation by general growth rate is equal each year to the commodity ranking of the base year, in this case 1997. The other two extrapolation methods can give different rankings depending on differences in commodity growth rates. For instance, the 1998 table in Annex 2 shows that the commodity rankings for the extrapolation methods are very close to the reported ranking, except for commodity “Gold, non-monetary” which was ranked 76 when using the regional growth rate. This rank is explained by the fact that from 1997 to 1998 the regional⁷ export value in this commodity fell from 35.1 to 4.0 million US dollars, which equals a decline by a rate of 0.11. To estimate the 1998 value for commodity “Gold, non-monetary” this method multiplies the value of base year 1997 with this rate (before adjustment to the total of 1998). If the multiplication rates of most other commodities are around 1.0, this means that any commodity which was greater than 11% of the value of “Gold, non-monetary” in 1997 will pass this commodity in the ranks. The fact that the reported 1998 value was still high means that the exports of Lebanon for this commodity did not follow the regional declining pattern.

⁵ Given that the 3 extrapolation methods do not differ very much, only the data for the extrapolation by general growth are shown.

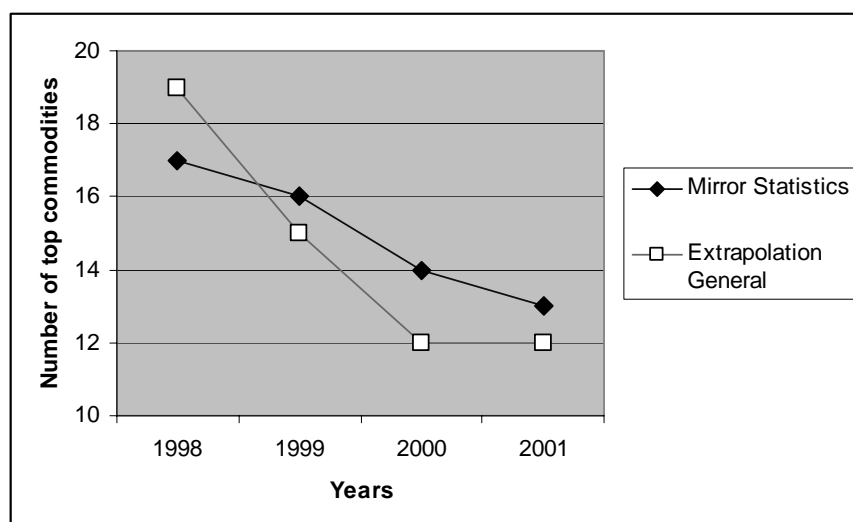
⁶ These two mentioned cases do raise the question to which degree classification of commodities may have caused a difference between reported and mirror statistics. The top reported commodity in 1998 was “Gold, silver ware, jewelry and articles of precious materials” which ranked second in the mirror statistics. It goes beyond the scope of this study, but it would be interesting to investigate in this triangle of “Gold, silver ware, jewelry and articles of precious materials”, “Gold, non-monetary” and “Pearl, precious and semi-precious stones, unworked or worked” to which countries Lebanon reported to have exported and which countries reported to have imported in these commodities from Lebanon in 1998.

⁷ The region was composed of Cyprus, Iran, Jordan, Kuwait, Oman, Syria and Turkey. The composition of the region depends on the availability of data in both the base year and the year of estimation, since the same group of countries should be present in both of those years.

11. In paragraph 8 an example was given (“Gold, non-monetary”) of how mirror statistics could miss some important export commodities due to the absence of some reporting (partner) countries from the mirror statistics or differences in classifying from country to country. On the other hand, mirror statistics are able to better detect changes in commodity structure of exports than extrapolation methods. Examples of these can be found in the 1999 and 2000 tables of Annex 2. In 1999 “Equipment for distribution of electricity” was reported as the 15th most important export commodity. The extrapolation (general growth rate) method ranked it at position 86. The mirror statistics estimated this commodity at rank 20. Another example is “Lime, cement and fabricated construction materials” which – based on reported data - was ranked 24 in 1997, but moved to position 10 in 1999, to 4 in 2000 and back to position 6 in 2001. The mirror statistics neatly followed this pattern by estimating this commodity at position 8 in 1999, to 4 in 2000, to 7 in 2001. The extrapolation methods stuck with the 1997 position 24 for all the years 1999 to 2001, except for the regional growth which estimated this commodity a bit higher, namely at position 17, for the year 2000. This shows a positive side of the mirror statistics method in detecting changes in commodity structure. This phenomena is also shown in the tables of Annex 1.

12. Graph 2 shows the number of commodities which were correctly estimated as belonging to the top 20 commodities. It shows that except for 1998 the mirror statistics are doing a slightly better job.

Graph 2
Number of estimated top commodities



In the case of Lebanon, 8 of the top 20 export commodities of 1997 were no longer in the top 20 commodities in 2000. It is not known if Lebanon’s case is representative for most countries. If export commodities fluctuate a lot mirror statistics are more flexible to detect them. However, the downside of mirror statistics is that at times it misses important commodities.

Deviation per main commodity

13. The third and last measure in determining good or bad estimates is the actual deviation between reported and estimated value per main commodity. The deviation will be presented here as percentage of the reported commodity value. Table 2 gives the average percentage deviation for the top 20 commodities. The table shows first of all that on the average the deviation is more than 30% of the reported value for all estimation methods, except the extrapolation methods in the adjacent year 1998 where the deviation is about 12%. It further shows that the extrapolation methods give increasingly bad estimates with every year

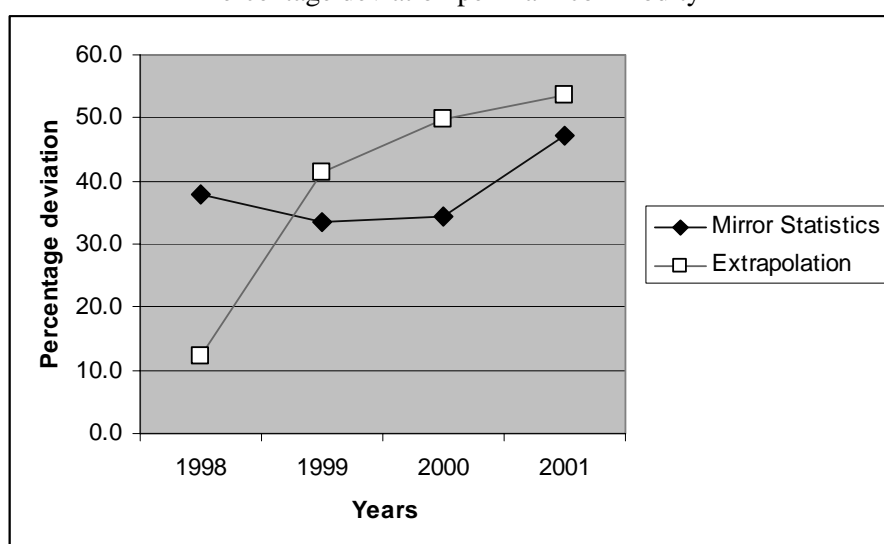
further away from the base year, whereas the estimates of the mirror statistics are relatively stable. And the mirror statistics give better estimates than extrapolation for each year after the 1998.

Table 2
Average percentage deviation per main commodity

<i>Percentage deviation</i>	1998	1999	2000	2001
Mirror Direct	37.6	33.3	34.8	46.5
Mirror Relative	38.0	33.4	34.5	47.3
Extrapolation General	12.3	41.3	49.9	53.6
Extrapolation World	11.9	40.4	48.9	55.7
Extrapolation Regional	33.6	38.9	48.5	56.4

Given that the two mirror statistics methods give very similar percentages of deviation for the four years, as do the three extrapolation methods among each other, Graph 3 presents the percentage deviation only for the relative mirror statistics and the general extrapolation method.

Graph 3
Percentage deviation per main commodity



Results summary

14. The results regarding the estimation of commodity export values for Lebanon for the years 1998 to 2001 can be summarized as follows:

- (i) The share of main commodities is estimated very well by the extrapolation method in case of the adjacent year.
- (ii) The direct mirror statistics give a bad estimate of the share of main commodities if the number of available reporting countries is not high enough.
- (iii) The percent share of main commodities in total trade decreases for the extrapolation method the further away the estimated years are from the base year, whereas the percent share for mirror statistics remains stable.

- (iv) The rank order of main commodities is estimated very well by the extrapolation method in case of the adjacent year.
- (v) This estimated rank order gets worse for the extrapolation method the further away the estimated years are from the base year; the estimated rank order for mirror statistics are slightly better.
- (vi) On the positive side the mirror statistics can detect changes in commodity structure of exports, but on the negative side this method can also completely fail to identify other main commodities depending on which countries are included in the mirror statistics and their reporting practices.
- (vii) In general, the percentage deviation per main commodity is over 30% for both estimation methods, except for the extrapolation methods in case of the adjacent year where it is about 12%.
- (viii) This deviation gets larger for the extrapolation method the further away the estimated years are from the base year; the deviations for mirror statistics are slightly better estimated except for the adjacent year.

Conclusion

15. More studies of this kind are necessary before any definite conclusions regarding advantages/disadvantages of the discussed methods can be reached. Nevertheless, the choice of estimation methods made in the preparation of estimates for the International Trade Statistics Yearbook - as mentioned in paragraph 2 - is not rejected by the results of this study.

Annex 1

Reported and Estimated values of main export commodities
In million US dollars
1998

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	49.1	64.7	58.9	52.3	55.0	60.1
Fruit and nuts, fresh, dried	36.2	48.8	44.5	30.7	30.3	31.4
Fertilizers, manufactured	36.1	31.1	28.4	33.3	31.9	33.5
Aluminum	32.3	15.5	14.1	29.6	29.1	38.8
Printed matter	24.0	43.7	39.8	24.6	25.3	20.9
Tobacco un-manufactured; tobacco refuse	21.3	22.7	20.7	19.5	17.9	16.5
Footwear	18.3	7.4	6.7	19.4	18.6	15.5
Gold, non-monetary (excluding gold ores and concentrates)	18.3	0.1	0.1	13.7	15.2	1.5
Men and boys outerwear, textile fabrics not knitted or crocheted	17.5	16.5	15.0	20.1	20.1	21.2
Vegetables, fresh or simply preserved; roots and tubers	16.9	20.2	18.4	15.5	16.5	12.5
Inorganic chemical elements, oxides and halogen salts	16.0	16.0	14.6	16.4	15.6	11.2
Women, girls, infants outerwear, textile, not knitted or crocheted	14.3	10.3	9.4	17.6	18.2	17.5
Paper and paperboard, precut, and articles of paper or paperboard	14.0	13.0	11.9	13.3	13.7	13.2
Edible products and preparations	13.1	2.8	2.5	14.7	14.5	13.8
Paper and paperboard	13.0	8.3	7.6	13.3	13.7	11.3
Outerwear knitted or crocheted, not elastic nor rubberized	11.8	8.6	7.9	14.6	14.0	13.5
Polymerization and copolymerization products	9.9	6.2	5.6	9.5	9.5	33.7
Furniture and parts thereof	9.6	9.7	8.9	9.4	9.9	10.0
Internal combustion piston engines, and parts thereof	9.5	0.2	0.2	13.5	14.2	17.2
Non-ferrous base metal waste and scrap	9.4	12.6	11.5	11.8	10.3	9.7

Annex 1 (continued)

Reported and Estimated values of main export commodities
In million US dollars
1999

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	53.0	72.6	68.8	53.5	53.7	77.6
Gold, non-monetary (excluding gold ores and concentrates)	40.5	0.0	0.0	14.0	11.2	3.4
Aluminum	33.8	16.5	15.7	30.3	30.3	34.8
Inorganic chemical elements, oxides and halogen salts	29.5	28.0	26.5	16.8	15.4	18.3
Fruit and nuts, fresh, dried	28.7	44.0	41.7	31.4	31.3	29.3
Printed matter	26.4	27.4	25.9	25.2	25.8	18.4
Tobacco un-manufactured; tobacco refuse	24.8	10.6	10.1	20.0	18.6	14.6
Vegetables, fresh or simply preserved; roots and tubers	18.1	22.7	21.5	15.9	17.3	10.8
Fertilizers, manufactured	17.8	11.8	11.2	34.1	31.5	21.7
Lime, cement, and fabricated construction materials	16.6	18.8	17.8	8.3	7.9	7.8
Soap, cleansing and polishing preparations	16.2	2.5	2.3	1.5	1.6	1.1
Paper and paperboard, precut, and articles of paper or paperboard	14.6	10.0	9.5	13.6	14.7	12.4
Non-ferrous base metal waste and scrap	13.2	13.2	12.5	12.0	10.0	9.3
Paper and paperboard	13.2	8.6	8.2	13.6	14.2	10.7
Equipment for distribution of electricity	11.5	8.4	7.9	1.2	1.3	1.0
Furniture and parts thereof	11.3	12.2	11.6	9.6	11.0	10.8
Outerwear knitted or crocheted, not elastic nor rubberized	10.2	4.9	4.6	15.0	15.0	11.2
Heating and cooling equipment and parts thereof	10.2	10.6	10.1	5.4	5.5	6.4
Men and boys outerwear, textile fabrics not knitted or crocheted	10.2	9.3	8.8	20.6	20.3	21.4
Footwear	9.6	6.4	6.1	19.9	19.1	9.6

Annex 1 (continued)

Reported and Estimated values of main export commodities
In million US dollars

2000

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	76.5	76.9	79.4	56.5	58.1	108.7
Gold, non-monetary (excluding gold ores and concentrates)	48.2	0.7	0.7	14.8	11.4	2.4
Inorganic chemical elements, oxides and halogen salts	43.9	32.4	33.5	17.7	17.2	9.9
Lime, cement, and fabricated construction materials	34.9	32.7	33.7	8.8	8.1	10.2
Fruit and nuts, fresh, dried	30.0	26.4	27.3	33.1	29.9	25.9
Printed matter	26.3	26.1	26.9	26.6	26.4	21.4
Tobacco un-manufactured; tobacco refuse	20.2	26.0	26.8	21.1	16.6	11.7
Non-ferrous base metal waste and scrap	18.4	24.9	25.7	12.7	11.7	10.1
Aluminum	16.6	17.2	17.8	32.0	34.0	43.1
Furniture and parts thereof	14.6	12.3	12.7	10.1	12.1	13.8
Vegetables, fresh or simply preserved; roots and tubers	14.5	7.4	7.6	16.8	16.7	9.5
Paper and paperboard, precut, and articles of paper or paperboard	13.9	8.9	9.2	14.3	15.5	15.6
Rotating electric plant and parts thereof	13.3	1.5	1.5	3.9	4.3	4.4
Paper and paperboard	13.1	5.2	5.3	14.3	15.4	11.5
Waste and scrap metal of iron or steel	11.7	10.2	10.6	9.4	9.0	8.8
Equipment for distribution of electricity	9.9	2.9	3.0	1.3	1.5	1.2
Fertilizers, manufactured	9.8	9.9	10.3	35.9	31.9	9.5
Soap, cleansing and polishing preparations	9.4	2.1	2.1	1.6	1.7	1.0
Vegetables, roots and tubers, prepared or preserved	9.0	8.0	8.3	7.5	7.1	4.9
Articles of plastic materials	8.8	3.6	3.7	6.7	7.8	6.7

Annex 1 (continued)

Reported and Estimated values of main export commodities
In million US dollars

2001

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	71.5	88.1	110.3	70.3	71.3	127.4
Gold, non-monetary (excluding gold ores and concentrates)	59.1	0.2	0.2	18.4	12.7	13.3
Inorganic chemical elements, oxides and halogen salts	40.7	28.5	35.7	22.0	21.2	22.3
Tobacco un-manufactured; tobacco refuse	37.6	34.1	42.6	26.3	19.3	11.6
Old clothing and other old textile articles; rags	35.4	0.2	0.2	4.0	3.5	2.9
Lime, cement, and fabricated construction materials	33.0	28.6	35.8	11.0	10.2	12.6
Rotating electric plant and parts thereof	29.8	0.6	0.8	4.8	5.9	5.7
Fruit and nuts, fresh, dried	29.4	38.6	48.3	41.3	38.1	30.9
Printed matter	27.0	32.2	40.3	33.1	34.3	26.9
Equipment for distribution of electricity	22.3	1.4	1.7	1.6	1.7	1.5
Furniture and parts thereof	20.0	18.3	23.0	12.6	15.6	15.0
Paper and paperboard, precut, and articles of paper or paperboard	18.2	11.1	13.9	17.8	20.7	19.6
Travel goods, handbags etc, of leather, plastics, textile, others	17.6	1.0	1.2	3.8	4.2	4.1
Paper and paperboard	15.4	7.7	9.6	17.9	19.1	20.9
Articles of plastic materials	15.4	9.3	11.7	8.3	9.8	8.2
Footwear	14.8	1.4	1.7	26.2	25.9	14.4
Vegetables, fresh or simply preserved; roots and tubers	14.7	11.6	14.6	20.9	22.7	12.9
Non-ferrous base metal waste and scrap	14.7	19.7	24.7	15.8	13.8	10.0
Waste and scrap metal of iron or steel	14.1	11.6	14.6	11.7	10.6	8.0
Aluminum	13.0	10.5	13.2	39.8	41.3	44.6

Annex 2

Rank order of main export commodities
1998

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	1	2	2	1	1	1
Fruit and nuts, fresh, dried	2	3	3	3	3	5
Fertilizers, manufactured	3	6	6	2	2	4
Aluminum	4	11	11	4	4	2
Printed matter	5	4	4	5	5	7
Tobacco un-manufactured; tobacco refuse	6	7	7	7	9	10
Footwear	7	23	23	8	7	11
Gold, non-monetary (excluding gold ores and concentrates)	8	162	162	14	12	76
Men and boys outerwear, textile fabrics not knitted or crocheted	9	9	9	6	6	6
Vegetables, fresh or simply preserved; roots and tubers	10	8	8	11	10	15
Inorganic chemical elements, oxides and halogen salts	11	10	10	10	11	17
Women, girls, infants outerwear, textile, not knitted or crocheted	12	17	17	9	8	8
Paper and paperboard, precut, and articles of paper or paperboard	13	13	13	17	17	14
Edible products and preparations	14	46	46	12	13	12
Paper and paperboard	15	21	21	16	16	16
Outerwear knitted or crocheted, not elastic nor rubberized	16	19	19	13	15	13
Polymerization and copolymerization products	17	28	28	20	21	3
Furniture and parts thereof	18	18	18	21	20	18
Internal combustion piston engines, and parts thereof	19	130	130	15	14	9
Non-ferrous base metal waste and scrap	20	15	15	18	19	19

Annex 2 (continued)
Rank order of main export commodities
1999

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	1	2	2	1	1	1
Gold, non-monetary (excluding gold ores and concentrates)	2	202	202	14	18	45
Aluminum	3	9	9	4	4	3
Inorganic chemical elements, oxides and halogen salts	4	4	4	10	12	9
Fruit and nuts, fresh, dried	5	3	3	3	3	5
Printed matter	6	5	5	5	5	8
Tobacco un-manufactured; tobacco refuse	7	15	15	7	8	12
Vegetables, fresh or simply preserved; roots and tubers	8	6	6	11	10	17
Fertilizers, manufactured	9	13	13	2	2	6
Lime, cement, and fabricated construction materials	10	8	8	24	23	24
Soap, cleansing and polishing preparations	11	50	50	74	70	83
Paper and paperboard, precut, and articles of paper or paperboard	12	16	16	17	15	13
Non-ferrous base metal waste and scrap	13	10	10	18	20	20
Paper and paperboard	14	19	19	16	16	18
Equipment for distribution of electricity	15	20	20	86	80	90
Furniture and parts thereof	16	12	12	21	19	16
Outerwear knitted or crocheted, not elastic nor rubberized	17	34	34	13	14	14
Heating and cooling equipment and parts thereof	18	14	14	31	31	28
Men and boys outerwear, textile fabrics not knitted or crocheted	19	17	17	6	6	7
Footwear	20	27	27	8	7	19

Annex 2 (continued)
Rank order of main export commodities
2000

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	1	2	2	1	1	1
Gold, non-monetary (excluding gold ores and concentrates)	2	91	91	14	21	62
Inorganic chemical elements, oxides and halogen salts	3	5	5	10	9	19
Lime, cement, and fabricated construction materials	4	4	4	24	24	17
Fruit and nuts, fresh, dried	5	6	6	3	4	4
Printed matter	6	7	7	5	5	7
Tobacco un-manufactured; tobacco refuse	7	8	8	7	12	13
Non-ferrous base metal waste and scrap	8	9	9	18	19	18
Aluminum	9	10	10	4	2	2
Furniture and parts thereof	10	12	12	21	18	10
Vegetables, fresh or simply preserved; roots and tubers	11	20	20	11	10	21
Paper and paperboard, precut, and articles of paper or paperboard	12	17	17	17	14	9
Rotating electric plant and parts thereof	13	60	60	44	41	38
Paper and paperboard	14	28	28	16	15	14
Waste and scrap metal of iron or steel	15	14	14	22	23	23
Equipment for distribution of electricity	16	43	43	86	77	89
Fertilizers, manufactured	17	15	15	2	3	22
Soap, cleansing and polishing preparations	18	51	51	74	71	94
Vegetables, roots and tubers, prepared or preserved	19	19	19	27	28	35
Articles of plastic materials	20	39	39	30	26	26

Annex 2 (continued)
Rank order of main export commodities
2001

Commodity Description	Reported	Direct use of mirror statistics	Relative use of mirror statistics	General growth rate	World commodity growth rate	Regional commodity growth rate
Gold, silver ware, jewelry and articles of precious materials	1	1	1	1	1	1
Gold, non-monetary (excluding gold ores and concentrates)	2	138	138	14	21	17
Inorganic chemical elements, oxides and halogen salts	3	8	8	10	10	9
Tobacco un-manufactured; tobacco refuse	4	5	5	7	15	22
Old clothing and other old textile articles; rags	5	132	132	52	57	62
Lime, cement, and fabricated construction materials	6	7	7	24	25	20
Rotating electric plant and parts thereof	7	95	95	44	40	38
Fruit and nuts, fresh, dried	8	4	4	3	3	4
Printed matter	9	6	6	5	5	7
Equipment for distribution of electricity	10	63	63	86	80	84
Furniture and parts thereof	11	10	10	21	18	15
Paper and paperboard, precut, and articles of paper or paperboard	12	14	14	17	12	12
Travel goods, handbags etc, of leather, plastics, textile, others	13	79	79	53	50	49
Paper and paperboard	14	25	25	16	16	11
Articles of plastic materials	15	20	20	30	26	27
Footwear	16	64	64	8	7	16
Vegetables, fresh or simply preserved; roots and tubers	17	13	13	11	9	19
Non-ferrous base metal waste and scrap	18	9	9	18	20	25
Waste and scrap metal of iron or steel	19	12	12	22	23	29
Aluminum	20	16	16	4	2	2