

Openness, Trade Performance and Economic Development

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ABSTRACT

This paper builds on the recently developed Trade Performance Index (TPI) with the aim of assessing and monitoring the multi-faceted dimensions of export performance and competitiveness by sector and by country. Using 6 digit trade data, this index calculates for each country in the world the level of competitiveness and diversification of a particular export sector. In particular, it brings out gains and losses in international market shares and sheds light on the factors causing these changes. Lastly, it monitors the evolution of export diversification for products and markets. Altogether, the TPI makes use of around two dozen quantitative performance indicators. In total this index provides a systematic overview of sectoral export performance.

Results obtained with the methodology developed in TPI are exemplified in the case of Tunisia, and a further investigation in the clothing sector is proposed. Lastly, two composite rankings are calculated. One refers to the overall *position* of each country and another refers to *changes in performance*. The ranking of developing countries highlights that trade development is on the whole positively correlated with economic development, whereas a sample of least developing countries underscores they have missed the full benefit of openness.

1-Introduction

Openness appears as a complex bundle of choices ranging from trade development to binding institutional reforms. Openness to Foreign Direct Investment should also be considered for instance. Notwithstanding this multidimensional character of the problem, focusing on trade alone makes sense since this authorises tackling a tangible indicator that can be computed for all countries in the world on a rather reliable and detailed basis.

Since the end of the European recovery after World war II, tariff rates have been divided by 10 at the world level, international trade has been multiplied by 17, world income has quadrupled, and income per capita has doubled. Incidentally, it is well known that periods of openness have generally been associated with prosperity, whereas protectionism has been the companion of recessions. In addition, the trade performance of individual countries tends to be a good indicator of economic performance since well performing countries tend to record higher rates of GDP growth. In total, there is a common perception that even if imperfect competition and second best situations offer the possibility of welfare improving trade policies, on average free trade is better than no trade.

This is a correct perception of things. However, the choice is generally not between free trade or no trade; in addition, the stylised facts referred to above do not demonstrate any causality between openness and growth —the distinction between growth and development deserves further comment. Hence, as illustrated by the contrasted results of developing countries, it would be a misperception to conclude that openness to trade systematically ignites the rocket of development. The majority of developing countries have joined the World Trade Organization (WTO) and have taken initiatives aimed at opening their economies. Nevertheless, the outcome has not been systematically positive since export performance sometimes remains disappointing and these countries steadily follow contrasted development paths. Guérin (1999) underscores that there is no systematic gain in growth associated with the binding to the multilateral rules of international trade.

Accordingly, Rodrik (2000) argues that integration into the world economy hardly substitutes for a development strategy. Openness has institutional prerequisites (social safety net, WTO prerequisites, enforcement of property rights, etc.) that divert resources from alternative purposes, whereas the payoffs of this integration are limited. In total, “(...) there is simply no credible evidence that should lead us to place a very high probability on the likelihood that a sustained, significant growth boost will follow from the lowering of barriers to trade and investment” (p.2).

Such doubts about the benefits of the integration to the world economy can be justified on the grounds that various export performances are associated with similar national choices in terms of openness. But tackling directly the relationship between trade performance and growth should

authorise a better understanding of the underlying mechanisms. It is however difficult to establish even an all embracing definition of successful trade performance. Trade champions contrast with certain specialised exporters that suffer from a deterioration in their terms of trade. For example, some developing countries record high growth rates by specialising in niche markets and concentrating their export markets, while other developing countries record more moderate rates of growth with a well diversified array of products and partner countries. In other cases, successful performance is the result of a favourable product or market penetration since the beginning. Successful performance can also be gauged in terms of a country's ability to adapt its export profile to changing patterns of world demand. The last approach is the most dynamic and demand-driven trade policy stance.

New theories of growth have extensively addressed such issues, while empirical estimates have failed to fix any clear relationship between openness and growth. Openness is certainly a prerequisite, not the engine of growth. It simply fuels the engines of investment, reform and credibility (Fontagné and Guérin, 1998).

Lastly, least developed countries have a strong feeling of having missed the bulk of the expected benefits of the conclusion of the Uruguay Round, and of having more recently been maintained in the *anti-chambre* of negotiations (the so called green room). As a response, an initiative of unilateral liberalisation to their benefits has been launched by the EU and has received interest from Canada and Japan. But is it a matter of insufficient openness of markets? Of deficient infrastructures? Of redundancy in specialisation? Of insufficient technical assistance? Or more fundamentally, and this is indeed a rather normative point of view, a matter of inappropriate specialisation?

An inappropriate specialisation should mean limited diversification of markets or products, a supply capacity orthogonal to the world demand, a shrinking competitiveness. In order to tackle this puzzle, a systematic screening of world trade has to be performed. This is precisely what we aim to do here. The Trade Performance Index (TPI thereafter) designed by ITC (UNCTAD-WTO) is computed using the world's largest trade database, COMTRADE (of the United Nations Statistics Division), covering 184 countries¹, where more than 90% of world trade in 3,500 products is reported at the 5-digit level of the SITC². Since COMTRADE captures around 90 % of world trade, the TPI is calculated not only for countries that report their own trade data, but also for over one hundred primarily low-income countries that do not report national trade statistics. Noticeably, it captures the position and evolution of developing countries, but addresses the same issue for developed countries. This helps to understand what are the hierarchies, and tackles their potential permanence.

¹ In the case of non-reporting countries, the trade is reconstituted on the basis of partner country statistics (mirror statistics). This approach does not capture trade among non-reporting countries.

² Standard International Trade Classification.

Given that such an amount of information would be overwhelming, products are grouped into 14 sectors (see appendix 2). Calculations are made at the product level and results are presented at the sectoral level and for each economy as a whole. For each country and each sector, the TPI provides a *general profile*, indicators on a country's *position* and indicators on *changes* in export performance in recent years. The scope of the paper is to investigate whether trade performance is the companion of economic development.

The rest of the paper fixes the scenery (2), presents the machinery (3), classifies all countries in the world according to their trade development and tackles the issues referred to above (4). Since it is a rather inconclusive story, it misses a concluding section.

2- Why trade development matters

The positive impact of trade openness on growth is associated, in a fully documented literature that has been frequently surveyed, with five basic principles³:

- First, *specialisation*: consumers and producers face a new set of relative prices. The latter reallocate scarce resources towards the advantaged activities. There is accordingly a gain in efficiency;
- Second, *variety*: in case of complete specialisation of producers, trade authorises to consume all products, as a final or intermediate consumption (Ethier, 1982). There is a reward for variety to consumers, and the efficiency of the basket of inputs increases with the bundle of intermediate products available.
- Third, *increasing returns*: economies of scale justify any market enlargement. However, conclusions are quite ambiguous. For instance, the gain is by large dependent of the process of firms' issue: a fixed market structure inhibits such gains in the many firms-complete specialisation scheme of monopolistic competition. In the same way, imposing consumers to buy a greater quantity of domestic products can be optimal: domestic firms increase their output and achieve economies of scale, while the variety is not reduced. Notwithstanding such arguments, economies of scale are generally referred to as a key objective of integration policies (cf. ex ante studies on the internal market).
- Fourth, there is a *pro-competitive effect*. In an oligopoly, there is no need for trade, but for openness: openness carries competition in an oligopoly (Markusen, 1981; Helpman and Krugman, 1985) since mark ups are negatively related to the number of competitors. In the monopolistic framework there is also such pro-competitive effect as long as the elasticity of demand increases as more varieties are offered to the consumer.
- Lastly, *positive externalities* are generally referred to. The technology is spread over the boundaries through trade and open countries benefit a better access to a world-wide basket of technology.

According to the classical view of openness, the gains to be obtained are one shot. Hence, openness does not affect the path of growth. To put it differently, there is no permanent gain of openness. The country has climbed one step of the staircase. Hence, the only mean to obtained durable gains of growth is to deepen permanently the openness process: trade in manufactures, in

³ This presentation differs slightly to the illuminating one put forward by Rivera-Batiz and Romer (1991): allocation, integration, redundancy.

agricultural products, in services etc. Hence, there is no scope for capturing a positive and durable effect of trade on growth.

The new international economics⁴ has reconsidered this rather uncomfortable outcome. There is scope for dynamic gains, durably modifying the pace of growth. Baldwin (1992) has made a first insight in this direction: there is a systematic underestimation of gains if one neglects such dynamic benefits. Francois, McDonald and Nordström (1996) however highlight the conditionality of such additional gain, depending on the impact of openness on the return to capital. Incidentally, such perspective make it possible losing to trade if one de-specialises from activities bearing dynamic economies of scale (Grossman and Helpman, 1993 ; Rivera-Batiz and Romer, 1991).

On the whole, gains to trade are not systematic; the new approaches (imperfect competition cum dynamics) enlarge the potential benefits while widening the conditions under which countries might miss such benefits. To put it differently, the only ascertained result is that a reversal of attitudes would be worse, boosting rents and the demand for increased protection.

Reinforcing such puzzling issues, empirical approaches to growth have failed to identify any ascertained positive relationship between trade and growth. Barro (1991) and the related literature try to identify the role of exports amongst the engines of growth and face difficult methodological questions. Turning to convergence estimates, Ben-David and Atiqur Rahman (1996) highlight the role of integration: there is by large more cases of *S* convergence between countries trading a lot among themselves. Such effect of integration should be particularly relevant in Europe: while various studies identify a positive impact (Levine et Renelt, 1992; Henrekson, Torstensson and Torstensson; 1996, Baldwin et Seghezza, 1996) it is difficult to justify why the trend of convergence has sloped down in a further integrating Europe (Martin, 1998). Economic geography might counteract the benefits of integration for peripheral regions in the integrated zone.

Interestingly, Levine and Renelt find a positive relationship between growth and the share of investment in the GDP and a positive relationship between the latter share and the openness (share of external trade in GDP). Hence, it appears that openness should not directly boost growth, but stimulate investment, the latter being the ultimate engine of growth (Fontagné and Guérin, 1998).

But according to the new theories of international trade, trade patterns should also matter: the intensity of specialisation and the type of products countries are specialised in should matter.

The intensity of specialisation matters, since non-specialisation and two-way trade in differentiated products increases variety. Backus, Kehoe and Kehoe (1992) obtain a positive impact of

⁴ Noticeably, Findlay (1984) argues that this line of reasoning is inherent to the reasoning on international trade, and identifies the roots of it in Ricardo.

the intra-industry nature of trade on productivity growth and gains in income per capita, controlling for scale economies. Busson and Villa (1997) obtain a positive impact of openness in an equation of growth including a convergence effect, while the specialisation impedes growth, with the exception of a small number of countries having matched the evolution of the world demand. In total, trade in variety should be beneficial, and conversely for specialisation. The question remains whether the causality is reversal: imperfect competition shows how trade in varieties increases with income per capita (Bergstrand, 1989), according to a “demand for difference” (Lassudrie-Duchêne, 1972). Hence, it would be preferable to tackle the impact on growth of the diversification in trade.

3- The technology for tackling trade development

The potential impact of trade patterns on economic growth has been addressed in the previous section. However, openness and trade patterns do not tackle export performances. Competitiveness and specialisation refer to two separate concepts: competitiveness refers to the advantage a country has in exporting a certain product over other countries, while specialisation refers to the allocation of resources within the exporting sector, under the assumption of balanced total trade.

Where do we start from?

As far as trade performance is concerned rough indicators are often mobilised, such as the level of openness (total trade in goods and services divided by GDP) or growth of exports over a given period (such as the World Bank's *World Development Indicators*). Departing from such indicators, recent research has paved the way to a better understanding of the relationships between global performance of economic systems, trade development and growth.

Two directions have been investigated: first, the definition of competitiveness as an outcome of microeconomic characteristics, rather than on the basis of macro-economic variables; second the use of trade data. In the latter perspective, the theoretical background refers to the product cycle and to the dynamics of specialisation.

According to the first approach, microeconomic and generally qualitative indicators are used to characterise the competitiveness of nations. In this light, the "Microeconomic index of competitiveness" (Porter and Christensen, 1999), is based on the micro-foundations of a country's competitiveness. Launched in 1998 as part of the Global Competitiveness Report, this index is based on a survey of some 4,000 businessmen and government officials in 58 countries, including OECD countries⁵. Regressing income per capita on this index explains more than 80% of the variance of income in the sample. A quantitative method was developed in order to complement the qualitative approach, which may be criticised on the ground of being limited to a small number of developing countries.

An alternative approach to such microeconomic measurement of competitiveness is to consider the relative position of a country or product on the international market, and its development over time. *Trade statistics* will then be mobilised. Trade statistics have the advantage of being available for a substantial number of countries, at a very disaggregated level. For those countries that do not report trade statistics, their trade profile can be (partially) completed by using mirror statistics.

⁵ Indicators range from the overall infrastructure quality to administrative infrastructure, information infrastructure, capital availability, human resources etc.

Lastly, trade data is broken down at the industry and product levels, which provides a disaggregated insight into trade performances.

The first step towards such an approach is to consider that the type of products countries are specialised in does matter. Busson and Villa (1997) highlight that matching the dynamics of the world demand has a positive on growth. CEPII (1998) underscores that countries converging towards developed countries are those specialised in the most dynamic sectors of international demand. In both cases, however, the underlying trade statistics are rather aggregated (71 industries), whereas changes in the world demand and the development of product cycles appear at the product level. Hence, it is worthwhile using disaggregated data to tackle the type of issues we are interested in here.

Feenstra and Rose (1997) address the same type of issue, taking as a starting point the so called product cycle theory of international trade. According to this theory, specialisation is driven by differences in technological capacities among countries. The underlying ricardian framework has been extended by Vernon (1966) or more recently Krugman, and has turned to become one key mechanism of the trade and growth theory “à la Grossman-Helpman” (Grossman and Helpman, 1991). The basic idea is very simple: if trade, per se, does not affect much growth, specialisation does. Accordingly, the type of product a country is specialised in matters.

In order to tackle this issue, Feenstra and Rose use the NBER trade database for US imports over the 1972-94 period, where 162 countries or jurisdictions export 1434 products to the U.S.. The US market is considered as the benchmark market, and authors consider the first year of exports to the US of each product and each exporter. The principle is to rank exporters according to their ability to sell at an early date the “new” products on the US market. Their rankings are strongly affected by geography: Canada is systematically the first exporter and should be classified, according to this methodology, as the leading innovator. Mexico is not very far. This being said, rankings obtained so far are strongly suggestive; interestingly, the changes in the ranking is also striking if one considers goods of the old economy, launched before 1984, from those of the new economy, launched since this breaking point.

Overall ranking reported in table 1 deserves further comment: Mexico, China, Taiwan, Brazil, Honk-Kong and Korea appear in the top list, whereas Africa is largely represented in the bottom of the ranking. More interestingly, the turning point of the mid eighties identifies European countries as a whole as the core of the losers (with the exception of Spain, Ireland and France), Germany and the UK being largely affected. In Table 1, the gainers are mostly Asian emerging countries (China, Taiwan, India etc.) but also African ones (Morocco, Tunisia, Mauritius, Egypt among others) or American ones (Colombia, Brazil etc.).

Does such ranking matter for growth? Feenstra and Rose estimate a rough equation of growth (cross country) that points out:

- no significant role of the exports/GDP ratio on growth;
- a large and positive impact of investment on growth;
- a convergence term;
- a negative impact of the ranking in the product cycle (a country at the bottom records a larger rank and thus less growth).

< Table 1 about here >

There are strong limitations for a screening of world trade to be based on the product cycle only. Independently from the assumption of a “generalised” product cycle and using a very disaggregated database, developing countries can be ranked according to their trade performance, based on various criteria. This is the aim of the methodology developed at ITC (UNCTAD-WTO). However, since the performance of individual countries cannot be determined on the basis of a restricted sample of countries or products, the derivation of the relative export performance has to be achieved by including a significant number of countries, together with a detailed product breakdown. Such methodology, developed under the acronym of TPI, provides for each country and each sector indicators on a country’s general profile, on a country’s position and on changes in a country’s export performance. Altogether, the TPI consists of 22 quantitative indicators of trade performance. Two composite rankings are calculated, one for the overall position of the country and sector under review and another one for the change in performance.

The need for a disaggregated analysis

All the information provided in TPI is grouped under three categories referring to “general profile”, “position” and “change”. All indicators are calculated for each of the 14 sectors at the product level. Original data used in the computation is at the 5-digit level of the SITC nomenclature, corresponding to some 3,500 *products* as a whole.

Firstly, *descriptive indicators* are provided, which will not be used in the calculation of the ranking. It is worthwhile computing their values since they provide valuable additional information for trade performance analysis. These are, for a given group of products: the value of exports (in thousand US \$) in 1998, the (weighted) trend of exports (94-98), the share in national exports in 1998, the share in national imports in 1998, the average annual change in per capita exports (94-98), the relative unit value in 1998, the average annual change in relative unit value (94-98) and the revealed

comparative advantage. A decreasing rank is calculated for the trend in exports and also for the change in per capita exports. However, these are indicative rankings that do not enter into the final ranking. Complementing this first set of information, the country specialisation index for the group of products considered is calculated and presented separately.

More interestingly for our purpose, the TPI provides a second set of indicators related to *positions*:

- Value of net exports (in thousand US \$);
- Per capita exports (US\$/inhabitant);
- Share in international market (%);
- Product diversification (number);
- Product spread (ranking);
- Market diversification (number);
- Market spread (ranking).

For each of these indicators, a ranking is established, by decreasing performance, which will be used in the calculation of a composite ranking of *position*. The reasons for calculating two separate indicators of diversification for products and markets are clarified below. The composite index of *position* considers a simple average of the corresponding two ranks (average of the rankings for P4-a and P4-b for instance).

Lastly, the TPI provides a second set of indicators related to *change*:

- Percentage change in international market share;
- Trend of import coverage by exports;
- Matching with dynamics of world demand;
- Change in product diversification;
- Change in product spread;
- Change in market diversification ;
- Change in market spread.

The percentage change of world market share (C1) is divided into four complementary effects that are quantified separately, namely the competitiveness effect, the impact of initial geographic and product specialisation and the adaptation to changes in the patterns of world demand.

All these indicators enter into a composite ranking of change.

Calculation of indicators TPI

Value of net exports: Net exports are defined as exports less imports. A country's net exports are a reliable indicator of its position on the world market for two reasons. Firstly, net exports eliminate re-exports, which would otherwise introduce a bias into the raw data. Secondly, the indicator takes into account the international division of production processes, since a large part of imported intermediate products found within exports usually belong to the same sector (e.g. electronic parts and assembled computers). Hence, net exports provide a very simple but reliable correction for dealing with the globalisation of production processes and the induced vertical specialisation of countries at various stages of production.

Per capita exports: The value of per capita exports indicates the level of outward lookingness of a country and the extent to which a country's population produces for the world market.

Share in world market (percentage share of world exports): The world market share for a specific country is the ratio of total country exports to total world exports. The market share can also be defined as the country's share in national markets for each partner country, and the importance of each of these partners in world trade.

Equation (1) defines the market share PM_i^t of country i at year t .

$$PM_i^t = \sum_j \sum_k \frac{X_{ijk}^t}{X_{...}^t} = \sum_j \sum_k \left[\frac{X_{ijk}^t}{X_{.jk}^t} * \frac{X_{.jk}^t}{X_{...}^t} \right] \quad (1)$$

with:

X_{ijk}^t country i exports of product k to country j at year t .

$X_{.jk}^t$ total exports of product k to country j at year t .

$X_{.j}^t$ total exports to country j at year t .

$X_{...}^t$ world exports of all products at year t .

$\frac{X_{ijk}^t}{X_{.jk}^t}$ the market share of country i in country j for the product k at year t .

$\frac{X_{.jk}^t}{X_{...}^t}$ the weight of the importing market in world imports.

Product diversification: Diversification, measured through exports, is a good indicator of production structures and industry's development level. Diversification limits the dependence on a small number of products and hence reduces a country's vulnerability to industry-specific external shocks. In order to capture the degree of product diversification, two separate indicators are calculated: the equivalent number of products and the spread.

The spread is the inverse of the corresponding concentration. The equivalent number (EN=1/Herfindal), is a theoretical value which represents the number of markets of identical size that would lead to the degree of export concentration exactly equal to the observed one. Because this indicator is not highly sensitive to activities of relatively weak importance, it is a measurement that is suited to sectoral studies. We start by presenting these indicators and then turn to an example illustrating the value added of combining the two indicators.

Calculating product differentiation by means of the equivalent number distinguishes for each country the equivalent number of exported goods of equal importance (either within each sector or in the whole national economy) leading to the same concentration of exports. The increase in rank is a function of the increase in the level of diversification (both for products and markets). The larger the index value, the greater the diversification of exports, and consequently the better the ranking.

The *spread index* complements the equivalent number. Spread indices measure the dispersion between the highest and lowest value in a given statistical serie. They are calculated using a weighted standard error. The spread index for products calculates for each country the distribution of export products and compares it to the average export value. The greater the distribution (i.e. spread) of exports from a country as compared to the average, the higher the value of the index.

If all countries export all products, one of these indicators would be sufficient. Since this is not the case, the combination of the two indicators is useful. The value added of combining the two indicators of dispersion can be illustrated by the example in Table 2.

For example, we consider 4 countries and 10 industries. Country A exhibits uniformity in the level of specialisation in its industries, thereby achieving the highest level of diversification. Country B is specialised with equal intensity in 5 out of the 10 industries. Country C exports products in 8 industries and is highly specialised in industry 7, which accounts for 35% of its exports. Lastly, country D exhibits the same specialisation patterns but tenfold. The choice between the two indicators

is not the same for country A and B on the one hand, and B and C and the other hand. Neither indicator discriminates simultaneously between countries belonging to each of these pairs.

< Table 2 about here >

Consider the country pair A and B: the spread is zero in both cases (indicating uniformity in the specialisation in industries) whereas the equivalent number is twice as large for country A (indicating that country A is diversified twice as much as B). The spread does not take into account the number of industries in which a country is active, but only the share of each industry in total exports. The equivalent number, on the other hand, ignores the differences in each industry's share to total exports and only focuses on the number of industries a country is active in. Hence, the spread indicator does not distinguish any differences between country A and country B, whereas the equivalent number finds differences between them.

In the case of countries B and C, the opposite result is obtained. The equivalent number of markets of equal size is 5 in both cases. However, since the dispersion is much larger in country C, the spread can rank these two countries.

In sum, country A is the most diversified country, followed by B. Countries C and D are the least diversified.

Lastly, the comparison of results for countries C and D highlights the advantage of using the weighted spread to the standard deviation. Using the standard deviation, the dispersion in country D is ten times larger than in country C, even though only their size differs.

In technical terms, the equivalent number (for products) is calculated as in equation (2) below:

$$NE_{icl}^t = \frac{1}{\sum_{k=1}^n \left(\frac{X_{i,k}^t}{X_{i,cl}^t} \right)^2} \quad (2)$$

with: $X_{i,k}^t$ the export of product k by country i at year t .

$X_{i,cl}^t$ country i exports of all products belonging to the cluster cl at year t .

$\frac{X_{i,k}^t}{X_{i,cl}^t}$ the share of product k in total exports of country i in cluster cl .

Turning to the index of weighted spread, equation (3) indicates that the standard deviation divided by the number of products times the average value of exports for individual products has been used.

$$S_{cl}^t = \left[\frac{\sqrt{\sum_{k=1}^{cl} \left(X_{i,k}^t - \bar{X}_{i,cl}^t \right)^2}}{N(\bar{X}_{i,cl}^t)} \right] \quad (3)$$

with:

$X_{i,k}^t$ country i exports of product k to market i in year t .

$\bar{X}_{i,cl}^t$ the average value of country i exports in year t for the cluster cl .

$\left(X_{i,k}^t - \bar{X}_{i,cl}^t \right)$ the deviation to the average of product k in cluster cl for country i .

$\sqrt{\sum_{k=1}^{cl} \left(X_{i,k}^t - \bar{X}_{i,cl}^t \right)^2}$ the standard deviation.

S_{cl}^t the weighted spread.

Diversification of markets: Diversifying partner countries reduces a country's dependence on a small number of export markets and hence the vulnerability to shocks within destination countries. In order to capture the degree of market diversification, the same two complementary indicators referred to above are used: the equivalent number of markets and the spread. The equivalent number used for calculating market diversification (equation 4) distinguishes for each country, the number of partner countries weighed according to their importance. The increase in rank is a function of the increase in the level of diversification of markets. The bigger the index value, the greater the diversification of markets and consequently the better the ranking.

$$NE_i^t = \frac{1}{\sum_{j=1}^p \left(\frac{X_{ijcl}^t}{X_{i.cl}^t} \right)^2} \quad (4)$$

with :

X_{ijcl}^t country i exports of all products belonging to the cluster cl to country j in year t .

$X_{i.cl}^t$ country i total exports of all products belonging to the cluster cl

$\frac{X_{ijcl}^t}{X_{i.cl}^t}$ the share of market j in country i total exports of products belonging to the cluster cl .

Spread indices measure the existing dispersion between the highest and lowest value of a given statistical series. They are calculated using the weighted standard error (equation 5). The spread index for markets compares for each country, the share of its exports directed to different partner countries with the average export value. The greater the dispersion of exports from this country (i.e. the greater the spread) as compared to the average, the higher the value of the index.

Concerning positions, the ranking of the 184 countries is a function of the degree of diffusion of exported products (of a country's exports to partner countries). The smaller the index, the more exported products are evenly distributed (amongst partner countries) and the better the ranking.

$$S_{pcl}^t = \left[\frac{\sqrt{\sum_{j=1}^p \left(X_{ijcl}^t - \bar{X}_{ipcl}^t \right)^2}}{N(\bar{X}_{ipcl}^t)} \right] \quad (5)$$

with:

X_{ijcl}^t country i total exports to market j in cluster cl in year t .

\bar{X}_{ipcl}^t country i average export to the p markets of products belonging to the cluster cl in year t

$\sqrt{\sum_{k=1}^{cl} \left(X_{ijcl}^t - \bar{X}_{ipcl}^t \right)^2}$ the standard deviation.

Change in world market share: Turning to variations, the decomposition of the variation in the world market share provides information on the competitiveness of the country considered. The market share variation can be tabulated as the simple average of the rankings according to four criteria: competitiveness, initial geographic specialisation, initial product specialisation and

responsiveness to changes in world demand. These indicators are calculated by decomposing changes in a country's market share in elementary markets.

An elementary market is defined as the destination market "j" for a specific product "k". The market share of country "i" in the world market can be written as the sum of partner countries (markets "j") as well as products (sectors "k"), weighted by the share of these markets in world exports.

The variation in country "i"'s market share is the total derivative of this weighted average. The equation can be written as the sum of the following components:

Competitiveness effect p.a.: Gains in market shares due to increased competitiveness. It is calculated as the change in the exporting country's share in destination market imports, multiplied by the initial share of the partner countries' imports in world trade.

Initial geographic specialisation p.a.: This effect captures the benefits associated with the initial specialisation of domestic exports on dynamic markets. Quantitatively, it is calculated as the initial market share of the exporting country in partner countries, multiplied by the change in the share of partner countries in world trade.

Initial product specialisation p.a.: This effect captures the benefits associated with the initial sector specialisation of domestic supply on products facing a dynamic demand. Quantitatively, it is calculated as the change in the share of elementary markets in world trade, multiplied by the difference between the initial share of the exporting country in elementary markets and the initial market share of the exporting country in destination markets.

Adaptation p.a.: This effect captures the ability to adjust the supply of exports to changes in world demand. This is obtained by calculating the cross variation of changes in country "i"'s market share and the change in its share of elementary markets in world imports. If both changes are positive (+,+), this indicates that over the period studied, country "i" has experienced an increase in its market share on dynamic elementary markets. It follows that the outcome from the cross variation is positive. If both changes are negative (-,-), it means that over the period studied, country "i" has experienced a decrease in its market share on recessive elementary markets. Thus, the cross variation is once again positive. In contrast, increasing market shares on recessive markets (+,-) or losing market shares on dynamic markets (-,+) leads to a negative cross variation.

In sum, the *ranking* for the change in market share is calculated as the simple average of the rankings for the 4 following items: competitiveness, geographic specialisation, product specialisation and responsiveness to changes in world demand.

More formally, the change in world market share can be written as in (3).

$$\partial PM_i = \sum_j \sum_k \partial \left[\frac{X_{ijk}}{X_{.jk}} \right] * \left[\frac{X_{.jk}^0}{X_{...}^0} \right] + \sum_j \sum_k \left[\frac{X_{ijk}^0}{X_{.jk}^0} \right] * \partial \left[\frac{X_{.jk}}{X_{...}} \right] + \sum_j \sum_k \partial \left[\frac{X_{ijk}}{X_{.jk}} \right] * \partial \left[\frac{X_{.jk}}{X_{...}} \right] \quad (3)$$

This is the sum of three terms, namely:

- the gains or losses in market shares associated with changes in competitiveness:

$$\sum_j \sum_k \partial \left[\frac{X_{ijk}}{X_{.jk}} \right] * \left[\frac{X_{.jk}^0}{X_{...}^0} \right]$$

- the benefits of the initial specialisation on dynamic markets:

$$\sum_j \sum_k \left[\frac{X_{ijk}^0}{X_{.jk}^0} \right] * \partial \left[\frac{X_{.jk}}{X_{...}} \right]$$

- the adaptation to the changes in world demand:

$$\sum_j \sum_k \partial \left[\frac{X_{ijk}}{X_{.jk}} \right] * \partial \left[\frac{X_{.jk}}{X_{...}} \right]$$

It is possible to split the effect of initial specialisation (the second term in equation 3) into two parts corresponding to the benefits of the initial specialisation by destination market and by product.

$$\sum_j \sum_k \left[\frac{X_{ijk}^0}{X_{.jk}^0} \right] * \partial \left[\frac{X_{.jk}}{X_{...}} \right] = \sum_j \left[\frac{X_{ij.}^0}{X_{.j.}^0} \right] * \partial \left[\frac{X_{.j.}}{X_{...}} \right] + \sum_j \sum_k \left[\frac{X_{ijk}^0}{X_{.jk}^0} - \frac{X_{ij.}^0}{X_{.j.}^0} \right] * \partial \left[\frac{X_{.jk}}{X_{...}} \right] \quad (4)$$

The first term on the right side of equation (4) corresponds to the effect of the initial specialisation on destination markets. The impact is positive if the country benefits from strong initial positions on dynamic markets. The second term refers to the impact of the initial product specialisation. The two terms are not symmetric since it is impossible to fully disentangle the geographic and sectorial impacts.

Trend of the coverage of imports by exports: The index is calculated as the average annual growth rate of the cover ratio between 1994-1998 (based on the ordinary least-squares method). It indicates the evolution of the trade balance for a group of products. A positive index will be associated with a positive trend.

Adapting to world demand: This index is calculated with a view to ranking countries according to their ability to adapt to the dynamics of world demand. It is based on Spearman's rank

correlation between the ranking share of the exporting countries' export products in its total exports, and the rank of growth trends in worldwide exports of those products. Each country is given a correlation index that takes a value between 1 and -1. A value of 1 (-1) indicates that the relative importance of a country's exported goods is in full accordance (discordance) with the ranking of world export growth rates for the same goods. the country ranking is dependent on the rank correlation index. The closer the index is to 1, the better the country ranking under analysis.

Change in the diversification of products: The change in the product diversification of a given country represents the average annual variation over the period 1994-1998 in the number of equivalent export products. The change in the product spread of a given country represents the average annual variation over the period 1994-1998 in the concentration of export products.

Change in market diversification: The change in the product diversification of a given country represents the average annual variation over the period 1994-1998 in the number of equivalent export markets. The change in the product spread of a given country represents the average annual variation over the period 1994-1998 in the concentration of export markets.

Interpretation of the results

The TPI ranks countries for each indicator according to two criteria: the *position*, which is essentially a "snapshot" of a country's performance at a given point of time, and the *evolution* of export performance over a given time period (5 years). The TPI positions the export sectors of member countries by export competitiveness, both from a static and dynamic perspective.

There are 5 groups of indicators for the *position* and the *evolution* based ranks (Table 3). The TPI is tabulated independently for the position and evolution of each country, and alternatively by combining the *position* and *evolution* into a synthetic index.

< Table 3 about here >

The final ranking is a weighted average of the individual rankings for each of the different indices. The improvement in the ranking reflects improvements in its trade performance (both in absolute and relative terms). As an example, table 4 shows the standard output of the TPI for Tunisia. Three types of indicators are presented in the table, namely the general profile, the position in 1998 and the change over 1994-98.

< Table 4 about here >

Figure 1 plots the TPI rankings reported in Table 4. For each exporting sector, the first bar represents the performance according to the end of period position. In the case of Tunisia, clothing is the most performing export sector in 1998. The second bar represents the performance according to changes over the period under consideration. Non-electrical machinery and wood products recorded the greatest progress in performance between 1994 and 1998. It should be noted that Tunisia only exports in all 14 clusters. Tunisia belongs to the top 20 for 4 out of 14 sectors, either in position or in change.

However, $\frac{3}{4}$ of the exports are concentrated in 4 sectors only. And in the 2 sectors in which its performance are the better, Tunisia is suffering from the emergence of new competitors.

Clothing being the leading sector for Tunisia, detailed results for this sector can be examined. Tunisia is ranked within the 10 world leaders according to its position, pooling the corresponding criteria (Table 5). Its competitors are located within the EU, in the CEECs, and in Asia. Italy leads this ranking, followed by Thailand, China, Portugal, the Republic of Korea, Turkey and Hungary. Among its competitors, Tunisia has not recorded the worst evolution: in this sector where rankings are redistributed at a high pace, only Hungary and China exhibit a better ranking than Tunisia according to our indicator of change.

< Table 5 about here >

However, looking at the various components of the composite index of position in 1998, Armenia, Paraguay, the Dominican Republic, Peru, Hong Kong,..., exhibit a better matching to the international demand. Finland, the Czech Republic, China, Thailand,... have a higher product diversification and product spread; and EU members (France, the UK, Italy, Germany, Spain,...) have a higher market diversification or market spread. In total, Tunisia exhibits a good ranking only in terms of net exports (15th rank) and noticeably net exports per capita (12th rank).

< Table 6 about here >

Accordingly, the Tunisian diversification is low in this sector, exports being concentrated on a few range of products: the equivalent number is 8 for the products, to be compared with 29 for China; Sri Lanka, Bulgaria or Romania could easily destabilise the good positions of Tunisia in the next future according to the evolutions observed in these countries. Lastly, the existing orientation towards traditional markets such as France, Germany, Italy and the Netherlands is increasingly detrimental, since these markets are less dynamic than Japan, the U.S., Australia, Japan or the U.A.E.. The preferential access granted by the EC since the seventies reaches here its limits.

4- So what?

We obtain for each sector and for the traded goods sector as a whole two rankings of all countries: one for their final position and another for their move during the five previous years. This is a huge amount of information however, whereas the aim of this paper is simply to tackle a controversial issue. Hence, we concentrate on this issue and neglect various interesting outcomes. For example, whereas the situation of Africa as a whole looks rather uncomfortable, detailed analysis would provide “success stories” (ITC, 2000).

The top and bottom rankings of selected indicators are given in Table 7 for the position of countries in 1988, and in Table 8 for the change in this position during the last 5 years. Not surprisingly, mono-exporters of energy are classified at the bottom of the list since product diversification is concerned (Iraq) or among the ten leaders since per capita exports are concerned when the absorption is low (Kuwait). More interestingly, one notices that China is the exporter offering the most diversified bundle of goods, followed by Italy and 3 other EU countries, before the U.S.. At the opposite of the spectrum, one finds least developed countries such as Mali, Burkina Faso, Chad. Per capita exports are the highest in Singapore, in Ireland, Belgium, Switzerland and the Netherlands. Least advanced countries have the lowest ratios: Somalia, Eritrea, Rwanda, Haiti. Results concerning the diversification of markets are less straightforward: SACU is better ranked than Germany and one finds unexpected countries in the ranking. Last but not least, the U.S. are stuck to the dynamics of the world demand, followed by Mexico, Sweden, Austria and Finland. One again, least developed countries such as Madagascar, Tonga or Benin have an offer which sounds quite orthogonal with transformations of the international market.

< Table 7 about here >

Turning to indicators of change, results reflect the redistribution of positions among exporters, some small exporters improving proportionally their position to a large extent. This explains why Eritrea, Afghanistan, Turkmenistan or Kyrgyzstan are well ranked: starting at the very bottom of the ranking, any gain appears dramatic.

< Table 8 about here >

All these observations can now be summarised in a composite index for trade as a whole, for each individual country. The result can be matched with incomes in order to address the issue of trade and economic development.

Firstly, in the line of Feenstra and Rose, it is possible to identify *a strong and positive relationship between income per capita (here, according to PPP), and the trade performance*. Hence,

there is a strong and positive relationship between trade performance and the living standard of exporters⁶ (Figure 2).

< Figure 2 about here >

However, this is not to say that rich countries are systematically performing well as far as trade is concerned. To underscore this, we consider the respective ranking of countries according respectively to their trade performance and to their life standard (PPP income per capita). Not surprisingly, Table 9 highlights that trade champions are not systematically countries having the highest PPP income per capita: none of the 4 trade champions, according to TPI, are in the first 10 richest countries in the world. High income countries are not necessarily largely opened (noticeably the U.S.). In addition, Singapore, Switzerland, Norway, Canada, Iceland or Austria are among the richest countries but poorer traders (remind services are excluded).

< Table 9 about here >

Notwithstanding such mismatch, the overall ranking of the 184 countries mirrors a stylised picture (Figure 3): rich countries are on average countries performing better as far as trade is concerned. The rank correlation is high and there are few outliers. *On average, gaining 3 ranks according to the trade performance authorises a country to gain 2 ranks in terms of life standard.*

< Figure 3 about here >

More interestingly, we must focus on what happens at the bottom of each ranking: let us consider the poorest countries belonging to the bottom 100 and/or the ones looking as trade underachievers. For poor countries or trade underachievers the relationship between the two rankings appear very weak (Figure 4). For countries ranked at the very bottom in terms of trade performance, the relationship between trade performance and living standard is negative, while a huge dispersion of countries is to be noticed. Countries such as Burundi, Rwanda, Benin, Eritrea or on a higher step Senegal, Nicaragua or Cuba are ranked similarly for both indicators. This is not the case for Tonga, Kiribati, Paraguay who enjoy a much higher level of income than predicted by their trade performance. The situation is opposite for Tanzania, Zimbabwe, Tadjikistan, Laos and Ghana, among others.

< Figure 4 about here >

⁶ For countries not covered by the World Bank, we have used various data and interpolated PPP income per capita.

One possible interpretation is that there is no strong determination of income by trade performance for these poor countries or, to put it more positively, that even poor country have scope to perform well in trade.

To sum up, there is a positive relationship between economic development and trade development. This answers at least partially the question put forward in the title of the paper. However, this does not mean that growth and trade performance are strongly correlated, as underscored in Figure 5. According to the convergence assumption, we should expect that poor countries catch up (Barro, 1991): a negative relationship between trade performance and growth should be observed (Barro, Sala-i-Martin, 1992). Conversely, according to the new trade and growth theory, specialisation matters and trade performance should fuel the growth process. Hence two opposite forces should be disentangled in a growth equation including a convergence term and identifying, among the various determinants of the trade performance (diversification of markets, products, etc.) the ones that matter for growth. This is on the research agenda.

< Figure 5 about here >

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TABLES AND CHARTS

Table 1: Product cycle based rankings

| Top ranking descending | Bottom ranking ascending | Selected changes new/old econ. |
|------------------------|--------------------------|--------------------------------|
| Canada | Equatorial Guinea | United Kingdom -9 |
| United Kingdom | Cuba | Germany -12 |
| Germany | Djibouti | Japan -2 |
| Japan | Cambodia | France +3 |
| France | Chad | Spain +9 |
| Mexico | Benin | Mexico +3 |
| Netherlands | Ethiopia | China, Hong Kong, Korea +4 |
| Italy | Rwanda | Taiwan, Singapore +7 |
| Belgium-Luxembourg | Burkina Faso | Brazil +5 |
| Switzerland | Togo | India, Indonesia +12 |
| China | Central Africa | Colombia +9 |
| Sweden | Burundi | Egypt +9 |
| Taiwan | Mauritania | Morocco +10 |
| Spain | Gambia | Tunisia +25 |
| Brazil | Iraq | Burundi -58 |
| Australia | Somalia | Libya -33 |
| Hong Kong | Samoa | Zambia -43 |
| Korea | Uganda | Sudan -31 |
| Denmark | Vietnam | Madagascar -25 |
| Austria | Malawi | Yemen -28 |

Source: adapted from Feenstra and Rose (1997)

Table 2: An example of complementarity between the two indicators of diversification

| | Country A | Country B | Country C | Country D |
|--------------------------|--------------|-------------|--------------|--------------|
| industry 1 | 20 | | 20 | 200 |
| industry 2 | 20 | | 15 | 150 |
| industry 3 | 20 | | 26 | 260 |
| industry 4 | 20 | | 20 | 200 |
| industry 5 | 20 | | 20 | 200 |
| industry 6 | 20 | 40 | | |
| industry 7 | 20 | 40 | 74 | 740 |
| industry 8 | 20 | 40 | 5 | 50 |
| industry 9 | 20 | 40 | 20 | 200 |
| industry 10 | 20 | 40 | | |
| Total exports | 200 | 200 | 200 | 2000 |
| Equivalent number | 10.00 | 5.00 | 5.00 | 5.00 |
| standard deviation | 0.00 | 0.00 | 20.71 | 207.10 |
| Weighted spread | 0.00 | 0.00 | 0.104 | 0.104 |
| Rank EN | 1 | 2 | 2 | 2 |
| Rank weighted spread | 1 | 1 | 3 | 3 |
| Ranking | 1 | 2 | 3 | 3 |

Table 3: Content of the TPI

| | Indicator | Unit | Weight in the ranking |
|------|---|-------------------------------------|------------------------------|
| G1 | Value of exports | Thousand current dollars, 1998 | No ranking |
| G2 | Trend in net exports | Percent, 1994-98 | 0 |
| G3 | Share in national exports | Percent | No ranking |
| G4 | Share in national imports | Percent | No ranking |
| G5 | Change in per capita exports | Percentage variation, 1994-98 | 0 |
| G6 | Relative unit value | No unit | 0 |
| G7 | Change in relative unit value | Percentage variation, 1994-98 | 0 |
| G8 | Comparative advantage (Not displayed) | Per thousands of exporter's trade | No ranking |
| P1 | Value of net exports | Thousand current dollars, 1998 | 1 |
| P2 | Per capita exports | Current dollars, 1998 | 1 |
| P3 | World market share | Percent | 1 |
| | Diversification of products | | (1) |
| P4-a | Equivalent number | No unit | 0.5 |
| P4-b | Product spread | No unit | 0.5 |
| | Diversification of markets | | (1) |
| P5-a | Equivalent number | No unit | 0.5 |
| P5-b | Market spread | No unit | 0.5 |
| C1 | Change in world market share reflecting: | Percentage variation, 1994-98 | (1) |
| | Change in competitiveness | Percentage variation, 1994-98 | 0.25 |
| | Initial geographic specialisation | Percentage points | 0.25 |
| | Initial product specialisation | Percentage points | 0.25 |
| | Adaptation to changes in world demand | Percentage points | 0.25 |
| C2 | Trend of the coverage of imports by exports | Percent, 1994-98 | 1 |
| C3 | Matching with the dynamics of world demand | No unit | 1 |
| | Change in the diversification of products | | (1) |
| C4-a | Variation of the equivalent number | No unit, only the ranking displayed | 0.5 |
| C4-b | Spread variation | No unit, only the ranking displayed | 0.5 |
| | Change in the diversification of markets | | (1) |
| C5-a | Variation of the equivalent number | No unit, only the ranking displayed | 0.5 |
| C5-b | Spread variation | No unit, only the ranking displayed | 0.5 |
| | TOTAL | | 10 |

Table 4: Results of TPI for Tunisia, 1998

| Indicators | TUNISIE | | Fresh food | | Processed food | | Wood products | | Textiles | | Chemicals | | |
|------------------|--------------------------|---|---|---------|----------------|---------|---------------|---------|------------|---------|-----------|---------|----|
| | | | Value | Ranking | Value | Ranking | Value | Ranking | Value | Ranking | Value | Ranking | |
| General profile | G1 | Value of exports (\$ 000) | 200 329 | | 354 957 | | 57 370 | | 125 635 | | 741 909 | | |
| | G2 | Trend of exports (94-98) p.a. | 4% | 109 | 6% | 80 | 23% | 34 | 23% | 32 | 8% | 72 | |
| | G3 | Share in national export | 4% | | 6% | | 1% | | 2% | | 13% | | |
| | G4 | Share in national import | 6% | | 5% | | 3% | | 18% | | 10% | | |
| | G5 | Average annual change in per capita exports | 1% | 97 | -3% | 142 | 11% | 52 | -4% | 121 | 6% | 83 | |
| | G6 | Relative unit value (world average = 1) | 1.4 | | 1.3 | | 1.1 | | 1.1 | | 1.1 | | |
| | G7 | Average annual change in relative unit value | 4% | | 7% | | -3% | | -6% | | -8% | | |
| Position in 1998 | P1 | Value of net exports (\$ 000) | -316 917 | 151 | -66 052 | 76 | -188 211 | 98 | -1 314 019 | 106 | -60 506 | 50 | |
| | P2 | Per capita exports (\$/inhabitant) | 21.9 | 103 | 38.9 | 64 | 6.3 | 96 | 13.8 | 53 | 81.2 | 46 | |
| | P3 | Share in world market | 0.08% | 84 | 0.15% | 56 | 0.03% | 79 | 0.09% | 57 | 0.14% | 48 | |
| | P4a | Product diversification (N° of equivalent products) | 6 | 74 | 3 | 89 | 13 | 27 | 8 | 60 | 5 | 89 | |
| | P4b | Product spread (concentration) | | 61 | | 73 | | 45 | | 60 | | 70 | |
| | P5a | Market diversification (N° of equivalent markets) | 5 | 105 | 5 | 74 | 7 | 39 | 5 | 64 | 11 | 34 | |
| | P5b | Market spread (concentration) | | 76 | | 60 | | 52 | | 61 | | 45 | |
| Change 1994-1998 | C1 | Sources | Percentage change of world market share* p.a. | 0.00% | | -0.06% | | 0.05% | | -0.06% | | 0.00% | |
| | | | Competitiveness effect p.a. | -0.02% | 122 | -0.05% | 115 | 0.06% | 40 | 0.07% | 29 | 0.00% | 63 |
| | | | Initial geographic specialisation p.a. | -0.01% | 131 | 0.00% | 81 | -0.01% | 91 | -0.01% | 83 | 0.00% | 80 |
| | | | Initial product specialisation p.a. | 0.02% | 44 | -0.02% | 104 | 0.02% | 29 | -0.03% | 84 | 0.01% | 41 |
| | | | Adaptation p.a. | 0.00% | 42 | 0.02% | 24 | -0.02% | 79 | -0.09% | 102 | -0.01% | 73 |
| | C2 | Trend of import coverage by exports | -5% | 110 | -3% | 103 | 10% | 34 | -12% | 92 | 2% | 61 | |
| | C3 | Matching with dynamics of world demand | | 57 | | 68 | | 13 | | 25 | | 31 | |
| | C4a | Change in product diversification (N° of equiv. | | 149 | | 12 | | 95 | | 72 | | 99 | |
| | C4b | Change in product spread (concentration) | | 147 | | 31 | | 99 | | 76 | | 102 | |
| | C5a | Change in market diversification (N° of equiv. markets) | | 136 | | 52 | | 45 | | 67 | | 94 | |
| | C5b | Change in market spread (concentration) | | 136 | | 53 | | 46 | | 65 | | 95 | |
| | | Composite ranking position | | 100 | | 61 | | 71 | | 69 | | 41 | |
| | Composite ranking change | | 145 | | 56 | | 20 | | 73 | | 75 | | |

Table 4: Continuing

| Indicateurs | TUNISIE | | Leather products | | Basic manufacturing | | Non-electric machinery | | Cons. Electronics | | Electronic components | | |
|------------------|----------------------------|---|---|---------|---------------------|---------|------------------------|---------|-------------------|---------|-----------------------|---------|----|
| | | | Value | Ranking | Value | Ranking | Value | Ranking | Value | Ranking | Value | Ranking | |
| General profile | G1 | Value of exports (\$ 000) | 261 089 | | 214 566 | | 91 177 | | 84 994 | | 525 887 | | |
| | G2 | Trend of exports (94-98) p.a. | 13% | 27 | 7% | 74 | 46% | 14 | 20% | 38 | 22% | 30 | |
| | G3 | Share in national export | 5% | | 4% | | 2% | | 1% | | 9% | | |
| | G4 | Share in national import | 1% | | 8% | | 14% | | 3% | | 7% | | |
| | G5 | Average annual change in per capita exports | 11% | 35 | -3% | 135 | 13% | 80 | 20% | 68 | 19% | 61 | |
| | G6 | Relative unit value (world average = 1) | 0,6 | | 1,7 | | 1,4 | | 1,1 | | 1,5 | | |
| | G7 | Average annual change in relative unit value | -19% | | 15% | | 12% | | 3% | | -2% | | |
| Position in 1998 | P1 | Value of net exports (\$ 000) | 208 296 | 17 | -443 873 | 105 | -1 019 175 | 85 | -150 953 | 44 | -47 213 | 41 | |
| | P2 | Per capita exports (\$/inhabitant) | 28,6 | 20 | 23,5 | 72 | 10,0 | 63 | 9,3 | 59 | 57,6 | 41 | |
| | P3 | Share in world market | 0,59% | 22 | 0,05% | 65 | 0,02% | 54 | 0,02% | 47 | 0,12% | 39 | |
| | P4a | Product diversification (N° of equivalent products) | 3 | 37 | 17 | 41 | 23 | 42 | 2 | 73 | 8 | 45 | |
| | P4b | Product spread (concentration) | | 36 | | 50 | | 50 | | 58 | | 46 | |
| | P5a | Market diversification (N° of equivalent markets) | 3 | 39 | 8 | 45 | 4 | 63 | 3 | 56 | 3 | 64 | |
| | P5b | Market spread (concentration) | | 36 | | 44 | | 56 | | 55 | | 51 | |
| Change 1994-1998 | C1 | Sources | Percentage change of world market share* p.a. | 0,07% | | -0,06% | | 0,06% | | 0,09% | | 0,07% | |
| | | | Competitiveness effect p.a. | 0,03% | 26 | -0,04% | 101 | 0,11% | 28 | 0,08% | 29 | 0,07% | 25 |
| | | | Initial geographic specialisation p.a. | 0,05% | 11 | -0,01% | 81 | 0,08% | 2 | 0,00% | 43 | -0,01% | 69 |
| | | | Initial product specialisation p.a. | -0,01% | 42 | -0,02% | 81 | -0,03% | 85 | 0,03% | 15 | 0,03% | 13 |
| | | | Adaptation p.a. | 0,00% | 21 | 0,00% | 56 | -0,10% | 79 | -0,03% | 50 | -0,01% | 57 |
| | C2 | Trend of import coverage by exports | -9% | 43 | -12% | 109 | 4% | 59 | 13% | 25 | 4% | 31 | |
| | C3 | Matching with dynamics of world demand | | 51 | | 73 | | 47 | | 60 | | 46 | |
| | C4a | Change in product diversification (N° of equiv. | | 43 | | 13 | | 20 | | 70 | | 68 | |
| | C4b | Change in product spread (concentration) | | 45 | | 26 | | 42 | | 74 | | 72 | |
| | C5a | Change in market diversification (N° of equiv. markets) | | 47 | | 33 | | 67 | | 59 | | 48 | |
| | C5b | Change in market spread (concentration) | | 48 | | 35 | | 67 | | 59 | | 50 | |
| | Composite ranking position | | 20 | | 63 | | 56 | | 59 | | 43 | | |
| | Composite ranking change | | 49 | | 66 | | 20 | | 61 | | 37 | | |

Table 4: Continuing

| Indicators | TUNISIE | | Transport equipment | | Clothing | | Misc. manufacturing | | Minerals | | |
|------------------|----------------------------|---|---|---------|-----------|---------|---------------------|---------|----------|---------|-----|
| | | | Value | Ranking | Value | Ranking | Value | Ranking | Value | Ranking | |
| General profile | G1 | Value of exports (\$ 000) | 43 498 | | 2 473 834 | | 85 372 | | 428 810 | | |
| | G2 | Trend of exports (94-98) p.a. | 26% | 22 | 7% | 74 | 24% | 34 | 0% | 121 | |
| | G3 | Share in national export | 1% | | 43% | | 2% | | 8% | | |
| | G4 | Share in national import | 8% | | 6% | | 5% | | 7% | | |
| | G5 | Average annual change in per capita exports | 11% | 82 | 7% | 77 | 3% | 113 | -3% | 119 | |
| | G6 | Relative unit value (world average = 1) | 1.2 | | 3.2 | | 0.8 | | 1.0 | | |
| | G7 | Average annual change in relative unit value | -11% | | -6% | | -3% | | 2% | | |
| Position in 1998 | P1 | Value of net exports (\$ 000) | -605 903 | 64 | 1 957 227 | 15 | -285 667 | 98 | -117 602 | 107 | |
| | P2 | Per capita exports (\$/inhabitant) | 4.8 | 75 | 270.9 | 12 | 9.3 | 73 | 47.0 | 71 | |
| | P3 | Share in world market | 0.01% | 63 | 1.41% | 19 | 0.02% | 64 | 0.11% | 70 | |
| | P4a | Product diversification (N° of equivalent products) | 3 | 52 | 8 | 73 | 19 | 37 | 2 | 95 | |
| | P4b | Product spread (concentration) | | 55 | | 59 | | 45 | | 79 | |
| | P5a | Market diversification (N° of equivalent markets) | 3 | 63 | 5 | 33 | 6 | 51 | 4 | 73 | |
| | P5b | Market spread (concentration) | | 58 | | 32 | | 51 | | 45 | |
| Change 1994-1998 | C1 | Sources | Percentage change of world market share* p.a. | 0.03% | | 0.01% | | -0.01% | | -0.04% | |
| | | | Competitiveness effect p.a. | 0.13% | 29 | 0.01% | 57 | 0.00% | 82 | -0.03% | 106 |
| | | | Initial geographic specialisation p.a. | 0.01% | 49 | -0.01% | 94 | 0.00% | 90 | 0.00% | 94 |
| | | | Initial product specialisation p.a. | -0.03% | 62 | 0.00% | 60 | 0.01% | 35 | 0.00% | 83 |
| | | | Adaptation p.a. | -0.08% | 61 | 0.00% | 33 | -0.02% | 92 | -0.01% | 82 |
| | C2 | Trend of import coverage by exports | 3% | 44 | -4% | 78 | 4% | 56 | -1% | 81 | |
| | C3 | Matching with dynamics of world demand | | 90 | | 63 | | 46 | | 91 | |
| | C4a | Change in product diversification (N° of equiv. | | 69 | | 61 | | 91 | | 49 | |
| | C4b | Change in product spread (concentration) | | 73 | | 68 | | 96 | | 55 | |
| | C5a | Change in market diversification (N° of equiv. markets) | | 71 | | 48 | | 30 | | 112 | |
| | C5b | Change in market spread (concentration) | | 71 | | 50 | | 29 | | 111 | |
| | Composite ranking position | | 70 | | 8 | | 58 | | 76 | | |
| | Composite ranking change | | 73 | | 72 | | 25 | | 116 | | |

Source: Authors calculation

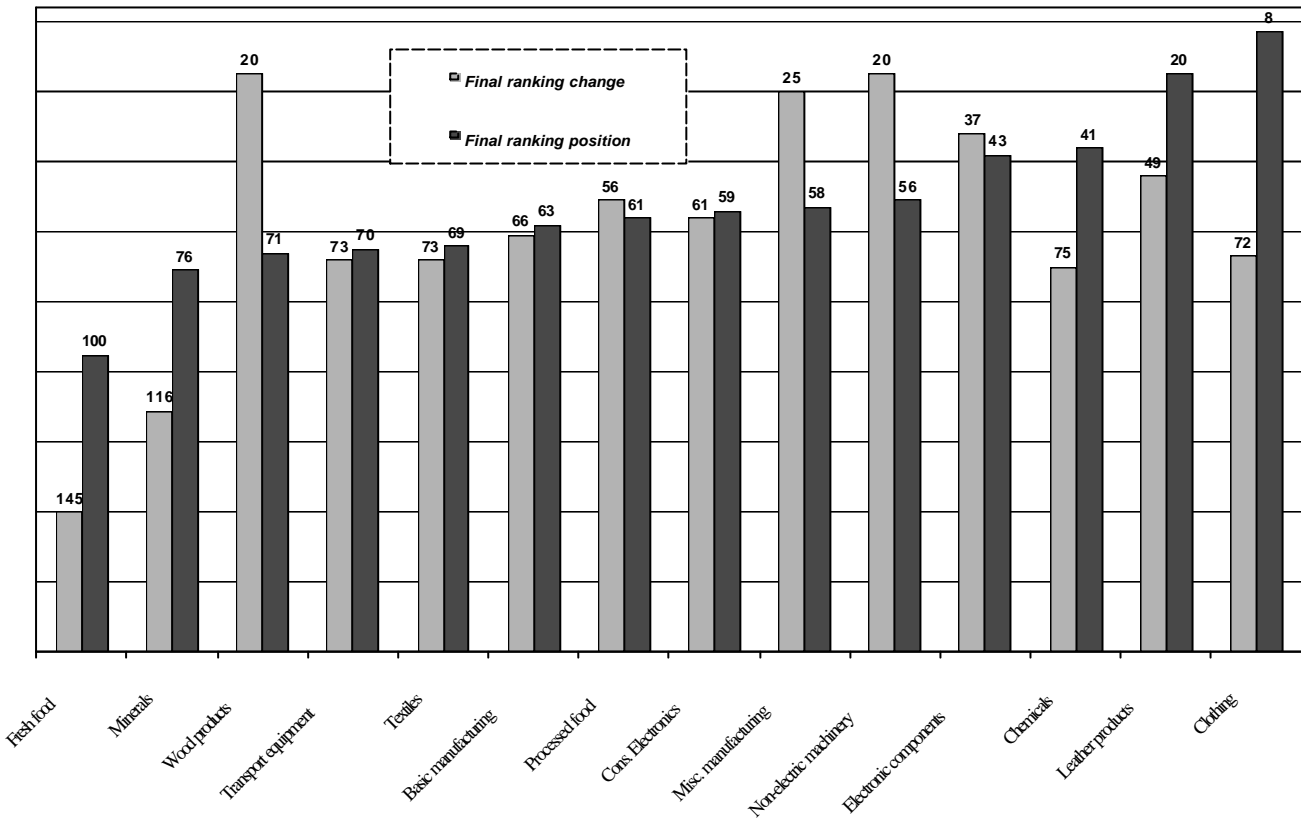
Table 5: Detailed results for clothing

| | Final position | Final change | Correlation with dynamics of world demand | Product diversification | Change in product diversification (Rank) | Product spread (Rank) | Change in product spread (Rank) | Market diversification | Change in market diversification (Rank) | Market spread (Rank) | Change in Market spread (Rank) |
|-----------------|----------------|--------------|---|-------------------------|--|-----------------------|---------------------------------|------------------------|---|----------------------|--------------------------------|
| Clothing | | | | | | | | | | | |
| ITALY | 1 | 79 | 111 | 31 | 25 | 27 | 24 | 3 | 12 | 3 | 14 |
| THAILAND | 2 | 111 | 82 | 4 | 29 | 4 | 27 | 14 | 107 | 5 | 107 |
| CHINA | 3 | 64 | 78 | 3 | 37 | 3 | 33 | 23 | 45 | 8 | 46 |
| PORTUGAL | 4 | 77 | 10 | 47 | 79 | 41 | 78 | 7 | 49 | 12 | 48 |
| KOREA REP. | 5 | 96 | 97 | 16 | 57 | 16 | 57 | 43 | 26 | 15 | 27 |
| TURKEY | 6 | 73 | 53 | 48 | 84 | 43 | 84 | 24 | 10 | 18 | 11 |
| HUNGARY | 7 | 39 | 59 | 7 | 46 | 8 | 46 | 28 | 20 | 28 | 21 |
| TUNISIE | 8 | 72 | 63 | 73 | 61 | 59 | 68 | 33 | 48 | 32 | 50 |
| SRI LANKA | 9 | 33 | 21 | 18 | 49 | 17 | 48 | 73 | 78 | 57 | 78 |
| TAIWAN | 10 | 85 | 19 | 43 | 82 | 38 | 81 | 78 | 69 | 43 | 67 |

Table 6: selected indicators of position in clothing: the 10 leaders (decreasing order)

| Dynamics of the world demand | Product diversification | Product spread | Market Diversification | Market spread |
|------------------------------|-------------------------|----------------|------------------------|---------------|
| ARMENIA | FINLAND | FINLAND | FRANCE,MONA | UNTD.KINGDO |
| PARAGUAY | CZECH REP | CZECH REP | UNTD.KINGDO | FRANCE,MONA |
| DOMINICAN RP | CHINA | CHINA | ITALY | ITALY |
| PERU | THAILAND | THAILAND | GERMANY | GERMANY |
| HONG KONG | NEW ZEALAND | NEW ZEALAND | SPAIN | THAILAND |
| BELGIQUE-LUX | FRANCE,MONA | FRANCE,MONA | FINLAND | USA,PR,USVI |
| NETHERLANDS | HUNGARY | SWEDEN | PORTUGAL | INDIA |
| MACAU | SWEDEN | HUNGARY | R.D.P. LAO | CHINA |
| SINGAPORE | ESTONIA | ESTONIA | KENYA | SPAIN |
| PORTUGAL | YUGOSLAVIA | PHILIPPINES | INDIA | NETHERLANDS |

Figure 1: TPI results for Tunisia by sector



Source: Authors calculation

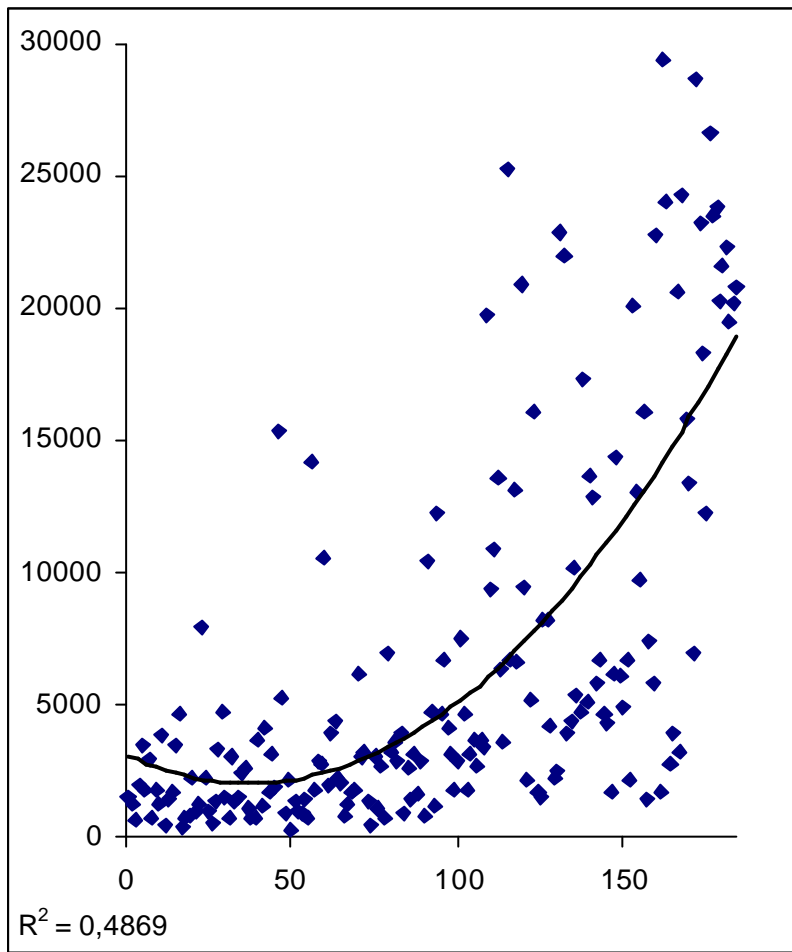
Table 7: top and bottom for selected indicators of position (14 sectors)

| Rank | Dynamics intal demand | Per cap exports | Product diversification | Product spread | Market Diversification | Market spread |
|-------|-----------------------|-----------------|-------------------------|----------------|------------------------|---------------|
| 1 | USA,PR,USVI | SINGAPORE | CHINA | CHINA | SACU | SACU |
| 2 | MEXICO | IRELAND | ITALY | ITALY | GERMANY | GERMANY |
| 3 | SWEDEN | BELGIQUE-LUX | DENMARK | AUSTRIA | RUSSIAN FED | SWEDEN |
| 4 | AUSTRIA | SWITZ.LIECHT | AUSTRIA | DENMARK | FINLAND | FINLAND |
| 5 | FINLAND | NETHERLANDS | NETHERLANDS | NETHERLANDS | EGYPT | UNTD.KINGDOM |
| 6 | UNTD.KINGDOM | SWEDEN | POLAND | USA,PR,USVI | SWEDEN | KOREA REP. |
| 7 | SWITZ.LIECHT | NORWAY,SB,JM | SWITZ.LIECHT | SWITZ.LIECHT | UKRAINE | INDIA |
| 8 | SINGAPORE | DENMARK | USA,PR,USVI | FRANCE,MONA | UNTD.KINGDOM | ITALY |
| 9 | NORWAY,SB,JM | FINLAND | CZECH REP | UNTD.KINGDOM | INDIA | FRANCE,MONA |
| 10 | NETHERLANDS | KUWAIT | UNTD.KINGDOM | POLAND | KOREA REP. | GREECE |
| (...) | | | | | | |
| 175 | GUINEE-BISSA | AZERBAIJAN | ANGOLA | TONGA | NIGER | COMORES |
| 176 | EQ.GUINEA | SUDAN | BURKINA FASO | VANUATU | ANGOLA | BHUTAN |
| 177 | KIRIBATI | BURKINA FASO | KIRIBATI | COMORES | REP.CENT.AFR | ST.KITTS-NEV |
| 178 | VANUATU | BURUNDI | TCHAD | BURUNDI | GAMBIA | SAMOA |
| 179 | REP.CENT.AFR | ETHIOPIA | NIGERIA | SAMOA | BHUTAN | PALAU |
| 180 | SUDAN | HAITI | BURUNDI | MICRONESIA | HAITI | KIRIBATI |
| 181 | SAMOA | RWANDA | YEMEN | EQ.GUINEA | CANADA | TONGA |
| 182 | BENIN | AFGHANISTAN | MALI | TCHAD | MEXICO | HAITI |
| 183 | TONGA | ERITREA | MARSHALL IS | MARSHALL IS | DOMINICAN RP | MARSHALL IS |
| 184 | MADAGASCAR | SOMALIA | IRAQ | KIRIBATI | KUWAIT | MICRONESIA |

Table 8: top and bottom for selected indicators of change (14 sectors)

| Rank | Per cap exports | Product diversification | Product spread | Market Diversification | Market spread |
|-------|-----------------|-------------------------|----------------|------------------------|---------------|
| 1 | IRAQ | ERITREA | ERITREA | ERITREA | ERITREA |
| 2 | YUGOSLAVIA | AFGHANISTAN | AFGHANISTAN | SEYCHELLES | SEYCHELLES |
| 3 | BOSNIA HERZG | TURKMENISTAN | TURKMENISTAN | KYRGYZSTAN | KYRGYZSTAN |
| 4 | EQ.GUINEA | SOLOMON IS | SOLOMON IS | NAURU | NAURU |
| 5 | HAITI | FIJI | FIJI | BAHRAIN | BAHRAIN |
| 6 | GEORGIA | AZERBAIJAN | AZERBAIJAN | SOLOMON IS | SOLOMON IS |
| 7 | CAMBODGE | GEORGIA | GEORGIA | YUGOSLAVIA | VIET NAM |
| 8 | PHILIPPINES | TRINIDAD TBG | TRINIDAD TBG | VIET NAM | YUGOSLAVIA |
| 9 | ESTONIA | DOMINICA | ANTIGUA,BARB | SOMALIA | SOMALIA |
| 10 | ERITREA | ANTIGUA,BARB | BARBADOS | SAMOA | SAMOA |
| (...) | | | | | |
| 175 | DOMINICA | KOREA REP. | KOREA REP. | CAP-VERT | CAP-VERT |
| 176 | KYRGYZSTAN | ESTONIA | GAMBIA | MALDIVES | BENIN |
| 177 | ST.LUCIA | GAMBIA | ESTONIA | ROUMANIE | MALDIVES |
| 178 | PAPUA N.GUIN | REP.MOLDOVA | REP.MOLDOVA | CUBA | MACAU |
| 179 | COMORES | KYRGYZSTAN | KYRGYZSTAN | MACAU | CUBA |
| 180 | SIERRA LEONE | LATVIA | LATVIA | PERU | PERU |
| 181 | TURKMENISTAN | HUNGARY | HUNGARY | DJIBOUTI | GAMBIA |
| 182 | MICRONESIA | SLOVAKIA | PHILIPPINES | GAMBIA | MONGOLIA |
| 183 | BANGLADESH | PHILIPPINES | SLOVAKIA | MONGOLIA | DJIBOUTI |
| 184 | BRAZIL | IRAQ | IRAQ | AZERBAIJAN | AZERBAIJAN |

Figure 2: Comparison of Trade Performance ranking and Life Standards (1998)



Note: TPI ranking of the 184 countries on the horizontal axis (position in 1998)

Source: authors calculation for TPI and World Bank for income.

Figure 3 Trade Performance ranking and Life Standards ranking (1998)

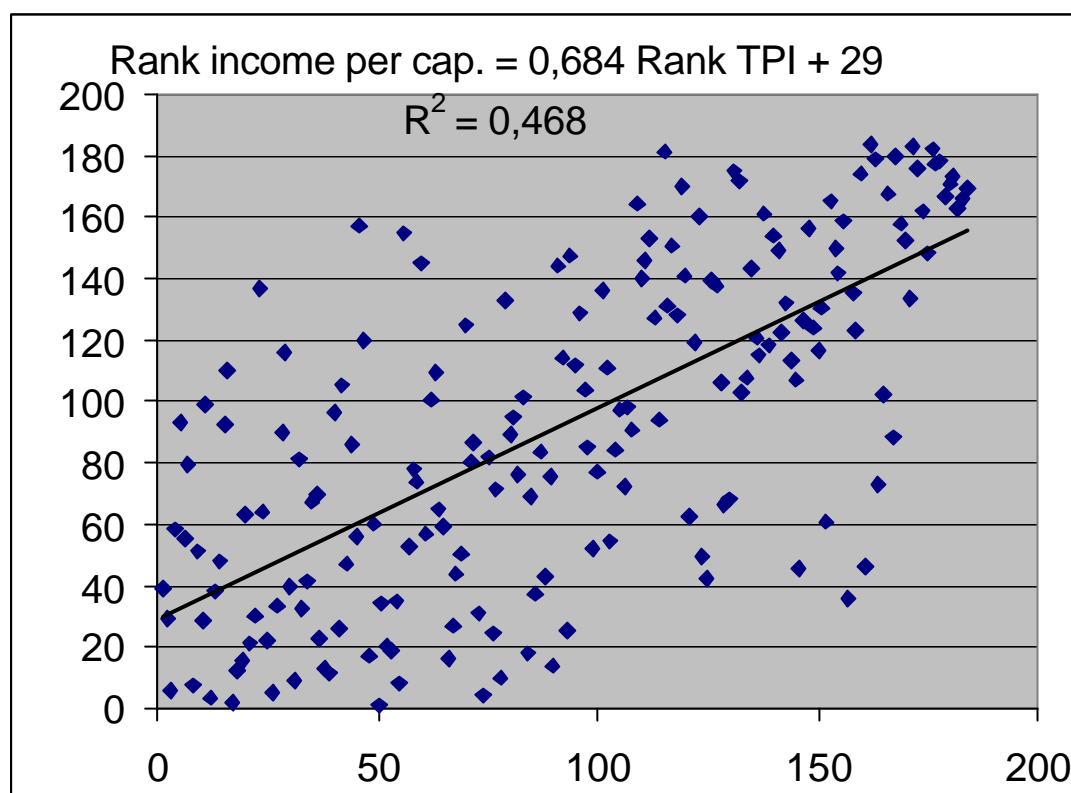


Table 9: Top countries according to TPI (in 1998) and their income per capita (bottom up rankings)

| Top rankings: <i>Trade</i> | | | Top rankings: <i>Income</i> | | |
|----------------------------|--------------|---------------|-----------------------------|---------------|--------------|
| Code ISO | <i>Trade</i> | <i>Income</i> | Code ISO | <i>Income</i> | <i>Trade</i> |
| DEU | 1 | 14 | USA | 1 | 23 |
| ITA | 2 | 17 | SGP | 2 | 13 |
| SWE | 3 | 20 | CHE | 3 | 9 |
| FRA | 4 | 11 | NOR | 4 | 17 |
| (...) | | | (...) | | |
| KOR | 10 | 31 | AUT | 10 | 25 |
| IRL | 11 | 21 | FRA | 11 | 4 |
| JPN | 12 | 8 | HKG | 12 | 53 |
| SGP | 13 | 2 | NLD | 13 | 5 |
| MYS | 14 | 42 | DEU | 14 | 1 |
| TWA | 15 | 28 | GBR | 15 | 19 |
| NZL | 16 | 24 | FIN | 16 | 6 |
| NOR | 17 | 4 | ITA | 17 | 2 |
| CHN | 18 | 74 | AUS | 18 | 32 |
| GBR | 19 | 15 | ARE | 19 | 76 |
| RUS | 20 | 62 | SWE | 20 | 3 |
| IDN | 21 | 84 | IRL | 21 | 11 |
| CAN | 22 | 5 | ISR | 22 | 47 |
| USA | 23 | 1 | ESP | 23 | 29 |

Source: TPI, authors calculation based on COMTRADE. Income per capita: World Bank

Figure 4 Trade Performance ranking and Life Standards ranking for the poorest countries (1998)

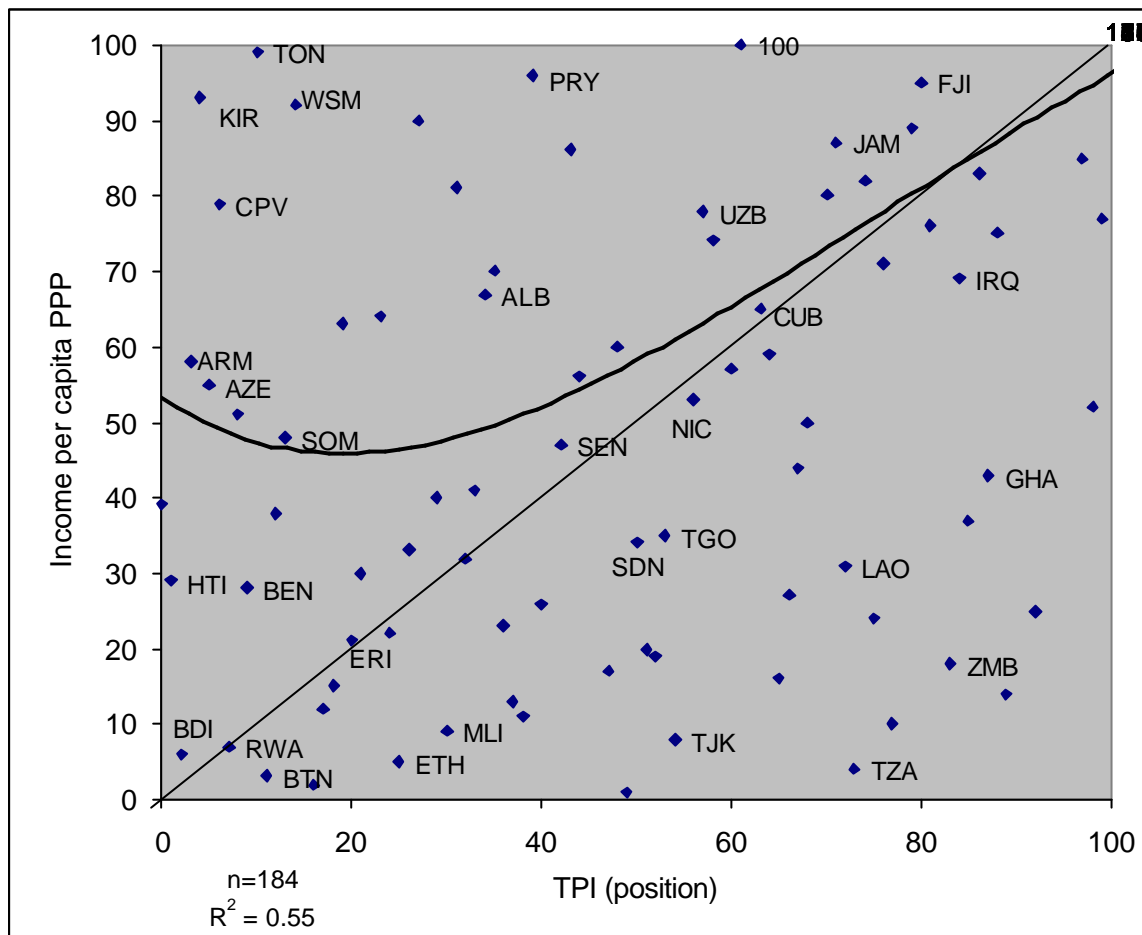
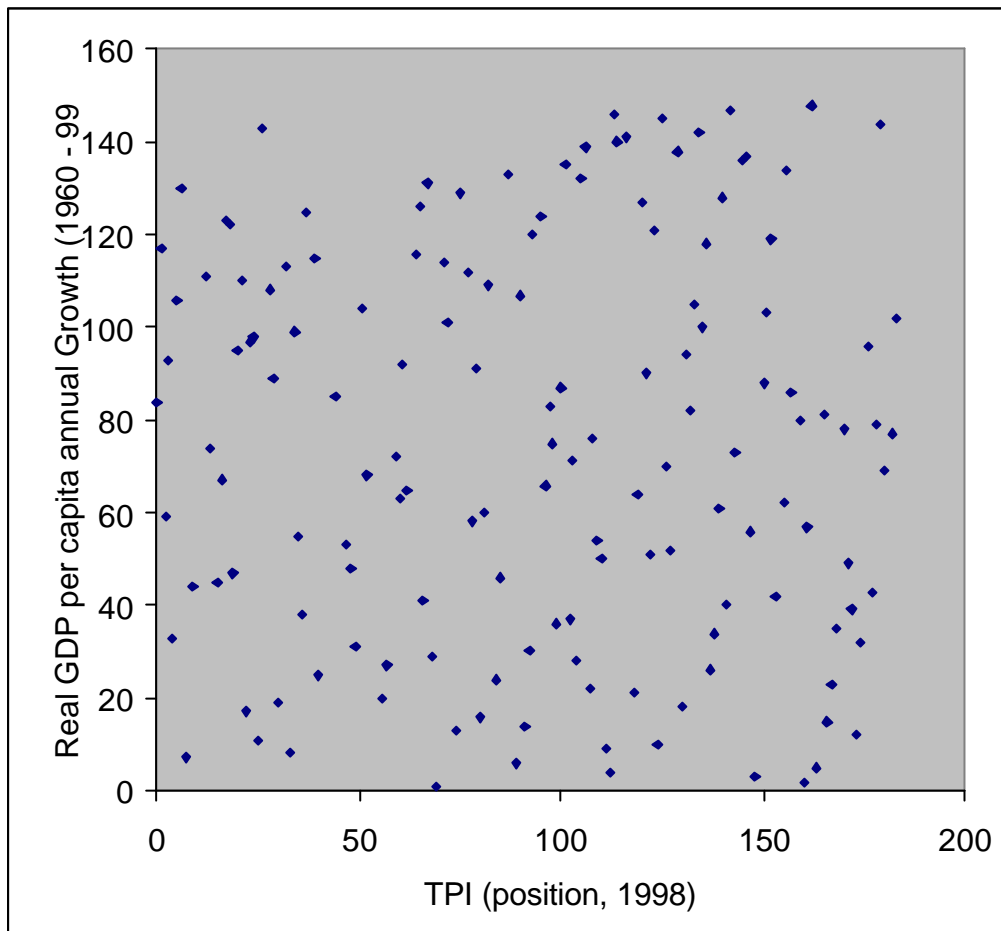


Figure 5 Trade Performance ranking and growth ranking (1960-98)



Note: Authors calculation, GDPs from CHELEM

Appendix-1: the combined ranking: summary

| | Indicators | What does it mean? | How is it calculated? | Ranking | Weight in the ranking |
|------|--|---|--|---------|-----------------------|
| G1 | Value of exports | Importance of the sector considered | Exports in 1998 | no | . |
| G2 | Trend of exports | Development of exports | Growth of exports over the period 1994-1998 (based on the least-squared method) | yes | 0 |
| G3 | Share in national exports | Importance of the products in national exports | Exports in the group of products divided by total exports | no | . |
| G4 | Share in national imports | Importance of the products in national imports | Imports in the group of products divided by total exports | no | . |
| G5 | Average annual change in per capita exports | Evolution in the outward lookingness of the economy | Percentage change in the ratio of exports to population | no | 0 |
| G6 | Relative unit value | Standard of quality reached by country exports | Unit value (value divided by quantity) of country relative to the world unit value | no | 0 |
| G7 | Average annual change in relative unit value | Change in the quality of country exports | Percent change of relative unit values | no | 0 |
| G8 | Revealed comparative advantage (Not displayed) | Specialisation of county under the assumption of balanced trade | Contribution to the trade balance defined as the difference between observed and theoretical relative trade surplus. | no | . |
| P1 | Value of net exports | Importance of the trade balance in the sector considered | Exports less imports in 1998 | yes | 1 |
| P2 | Per capita exports | Extent to which the labour force produces for the world market | Exports divided by population | yes | 1 |
| P3 | Share in world market | Success on the world market | Percentage share of world imports | yes | 1 |
| | Product diversification, reflecting: | Number and weight of exported products | See cells below | | (1) |
| P4-a | Equivalent number | Number of export products of equal size that would lead to the observed concentration of exports | Inverse of the Herfindhal index | yes | 0.5 |
| P4-b | Product spread | Concentration of export markets by value | Weighted standard error | yes | 0.5 |
| | Market diversification, reflecting: | Number and weight of partner countries | See cells below | yes | (1) |
| P5-a | Equivalent number | Number of markets of equal size that would lead to the observed concentration of exports | Inverse of the Herfindhal index | yes | 0.5 |
| P5-b | Market spread | Concentration of export markets by value | Weighted standard error | yes | 0.5 |
| C1 | Percentage annual change in world market share reflecting: | Change in global performance | Change in the world market share | no | (1) |
| | Change in competitiveness | Gain in market share due to increased competitiveness | Change in the exporting country's share in destination markets' imports times by the initial share of partner countries' imports in world trade (weighted average of the variation in the country's position on elementary markets*) | yes | 0.25 |
| | Initial geographic specialisation | Benefits associated with the initial specialisation of domestic exporters on dynamic markets | Initial market share of the exporting country in partner countries times by the change in the share of partner countries in world trade (weighted average of variations in the relative importance of export markets) | yes | 0.25 |
| | Initial product specialisation | Benefits associated with the initial sectorial specialisation of domestic supply on products characterised by dynamic demand. | Change in the share of elementary markets in world trade times by the difference between the initial share of the exporting country in elementary markets* and the initial market share of the exporting country in destination markets (initial product orientation weighted average of changes in destination market's share in world imports) | yes | 0.25 |
| | Adaptation to changes in world demand | Ability to adjust export supply to changes in world demand | Change in the share of the elementary markets* in world trade times by the change in the exporting county's market share in these elementary markets* | yes | 0.25 |
| C2 | Trend of import coverage by exports | Development of sectorial surplus or deficit of exports over imports | Growth trend of the coverage ratio (exports divided by imports) over the period 1993-1998 (based on the least-squared method) | yes | 1 |
| C3 | Matching with the dynamics of world demand | Focus of the national export portfolio on the world's most dynamic products | Spearman's rank correlation between the country's share of export products in national exports and the respective trends in world demand | yes | 1 |
| | Change in product diversification: | Ability to develop new export products | See cells below | yes | (1) |
| C4-a | Change in the equivalent number | Change in the number of export products of equal size that would lead to the observed concentration of exports | Variation in the inverse of the Herfindhal index | yes | 0.5 |
| C4-b | Change in the product spread | Change in the concentration of the export markets by value | Variation in the weighted standard error | yes | 0.5 |
| | Change in the diversification of markets | Ability to penetrate new markets | See cells below | yes | (1) |
| C5-a | Change in the equivalent number | Change in the number of markets of equal size that would lead to the observed concentration of exports | Variation in the inverse of the Herfindhal index | yes | 0.5 |
| C5-b | Change in market spread | Change in the concentration of the distribution of export markets | Variation in the weighted standard error | yes | 0.5 |

Notes: All absolute values refer to 1998; growth rates to the period 1994 - 1998. World trade is calculated on the basis some 80 reporting countries, which cover approximately 90% of actual world trade.

Coverage of non-reporting countries: the trade of non-reporting countries is reconstituted on the basis of partner country statistics (mirror statistics). This approach does not capture trade among non-reporting countries.

* An elementary market refers to one country's export of a specific product to a specific market.

Appendix-2: the classification of products

| Sectors | SITC Rev.3 | Products |
|---|---------------|--------------------------|
| 1 Fresh food and agrobased products | 001 | LIVE ANIMALS |
| | 011 | BOVINE MEAT |
| | 012 | OTHER MEAT, MEAT OFFAL |
| | 034 | FISH,FRESH,CHILLED,FROZN |
| | 036 | CRUSTACEANS,MOLLUSCS ETC |
| | 041 | WHEAT, MESLIN, UNMILLED |
| | 0421 | RICE |
| | 043 | BARLEY, UNMILLED |
| | 044 | MAIZE UNMILLED |
| | 045 | OTHER CEREALS, UNMILLED |
| | 054 | VEGETABLES |
| | 057 | FRUIT,NUTS EXCL.OIL NUTS |
| | 071 | COFFEE,COFFEE SUBSTITUTE |
| | 072 | COCOA |
| | 074 | TEA AND MATE |
| | 075 | SPICES |
| | 121 | TOBACCO, UNMANUFACTURED |
| | 211 | HIDES,SKINS(EX.FURS),RAW |
| | 212 | FURSKINS, RAW |
| | 222 | OILSEED(SFT.FIX VEG.OIL) |
| | 223 | OILSEED(OTH.FIX.VEG.OIL) |
| | 231 | NATURAL RUBBER, ETC. |
| | 261 | SILK |
| | 263 | COTTON |
| | 264 | JUTE,OTH.TEXTL.BAST FIBR |
| | 265 | VEGETABLE TEXTILE FIBRES |
| | 268 | WOOL, OTHER ANIMAL HAIR |
| | 291 | CRUDE ANIMAL MATERLS.NES |
| | 292 | CRUDE VEG.MATERIALS, NES |
| 2 Processed food and agro-based products | 016 | MEAT,ED.OFFL.DRY,SLT,SMK |
| | 017 | MEAT,OFFL.PRPD,PRSVD,NES |
| | 022 | MILK AND CREAM |
| | 023 | BUTTER,OTHER FAT OF MILK |
| | 024 | CHEESE AND CURD |
| | 025 | EGGS,BIRDS,YOLKS,ALBUMIN |
| | 035 | FISH,DRIED,SALTED,SMOKED |
| | 037 | FISH ETC.PRPD,PRSVD.NES |
| | 0422 | RICE |
| | 0423 | RICE |
| | 046 | MEAL,FLOUR OF WHEAT,MSLN |
| | 047 | OTHER CEREAL MEAL,FLOURS |
| | 048 | CEREAL PREPARATIONS |
| | 056 | VEGTABLES,PRPD,PRSVD,NES |
| | 058 | FRUIT,PRESERVED,PREPARED |
| | 059 | FRUIT, VEGETABLE JUICES |
| | 061 | SUGARS,MOLASSES,HONEY |
| | 062 | SUGAR CONFECTIONERY |
| | 073 | CHOCOLATE,OTH.COCOA PREP |
| | 081 | ANIMAL FEED STUFF |
| | 091 | MARGARINE AND SHORTENING |
| | 098 | EDIBLE PROD.PREPRTNS,NES |
| | 111 | NON-ALCOHOL.BEVERAGE,NES |
| | 112 | ALCOHOLIC BEVERAGES |
| | 122 | TOBACCO, MANUFACTURED |
| | 411 | ANIMAL OILS AND FATS |

| | | |
|--|------|--------------------------|
| | 421 | FIXED VEG.FAT,OILS, SOFT |
| | 422 | FIXED VEG.FAT,OILS,OTHER |
| | 431 | ANIMAL,VEG.FATS,OILS,NES |
| | 551 | ESSNTL.OIL,PERFUME,FLAVR |
| 3 Wood, wood products and paper | 244 | CORK,NATURAL,RAW;WASTE |
| | 245 | FUEL WOOD, WOOD CHARCOAL |
| | 246 | WOOD IN CHIPS, PARTICLES |
| | 247 | WOOD ROUGH,ROUGH SQUARED |
| | 248 | WOOD, SIMPLY WORKED |
| | 251 | PULP AND WASTE PAPER |
| | 633 | CORK MANUFACTURES |
| | 634 | VENEERS, PLYWOOD, ETC. |
| | 635 | WOOD MANUFACTURES, NES |
| | 641 | PAPER AND PAPERBOARD |
| | 642 | PAPER,PAPERBOARD,CUT ETC |
| | 8215 | Wooden furniture |
| 4 Yarn, fabrics and textiles | 651 | TEXTILE YARN |
| | 652 | COTTON FABRICS, WOVEN |
| | 653 | FABRICS,MAN-MADE FIBRES |
| | 654 | OTH.TEXTILE FABRIC,WOVEN |
| | 655 | KNIT.CROCHET.FABRIC NES |
| | 656 | TULLE,LACE,EMBROIDRY.ETC |
| | 657 | SPECIAL YARN,TXTL.FABRIC |
| | 658 | TEXTILE ARTICLES NES |
| | 659 | FLOOR COVERINGS, ETC. |
| 5 Chemicals | 232 | SYNTHETIC RUBBER, ETC. |
| | 266 | SYNTHETIC FIBRES |
| | 267 | OTHER MAN-MADE FIBRES |
| | 511 | HYDROCARBONS,NES,DERIVTS |
| | 512 | ALCOHOL,PHENOL,ETC.DERIV |
| | 513 | CARBOXYLIC ACIDS,DERIVTS |
| | 514 | NITROGEN-FUNCT.COMPOUNDS |
| | 515 | ORGANO-INORGANIC COMPNDS |
| | 516 | OTHER ORGANIC CHEMICALS |
| | 522 | INORGANIC CHEM.ELEMENTS |
| | 523 | METAL.SALTS,INORGAN.ACID |
| | 524 | OTHER CHEMICAL COMPOUNDS |
| | 525 | RADIO-ACTIVE MATERIALS |
| | 531 | SYNTH.COLOURS,LAKES,ETC. |
| | 532 | DYEING,TANNING MATERIALS |
| | 533 | PIGMENTS, PAINTS, ETC. |
| | 541 | MEDICINES,ETC.EXC.GRP542 |
| | 542 | MEDICAMENTS |
| | 553 | PERFUMERY,COSMETICS,ETC. |
| | 554 | SOAP,CLEANERS,POLISH,ETC |
| | 562 | FERTILIZER,EXCEPT GRP272 |
| | 571 | POLYMERS OF ETHYLENE |
| | 572 | POLYMERS OF STYRENE |
| | 573 | POLYMERS,VINYL CHLORIDE |
| | 574 | POLYACETAL,POLYCARBONATE |
| | 575 | OTH.PLASTIC,PRIMARY FORM |
| | 579 | PLASTIC WASTE, SCRAP ETC |
| | 581 | PLASTIC TUBE,PIPE,HOSE |
| | 582 | PLASTIC PLATE,SHEETS,ETC |
| | 583 | MONOFILAMENT OF PLASTICS |
| | 591 | INSECTICIDES, ETC. |
| | 592 | STARCHES,INULIN,ETC. |
| | 593 | EXPLOSIVES,PYROTECHNICS |
| | 597 | PREPRD ADDITIVES,LIQUIDS |

| | | |
|--|-----|---------------------------|
| | 598 | MISC.CHEMICAL PRODTS.NES |
| | 621 | MATERIALS OF RUBBER |
| | 625 | RUBBER TYRES,TUBES,ETC. |
| | 629 | ARTICLES OF RUBBER, NES |
| 6 Leather and leather products | 611 | LEATHER |
| | 612 | MANUFACT.LEATHER ETC.NES |
| | 613 | FURSKINS,TANNED,DRESSED |
| | 831 | TRUNK,SUIT -CASES,BAG,ETC |
| | 851 | FOOTWEAR |
| 7 Metal and other basic manufacturing | 661 | LIME,CEMENT,CONSTR.MATRL |
| | 662 | CLAY,REFRCT.CONSTR.MATRL |
| | 663 | MINERAL MANUFACTURES,NES |
| | 664 | GLASS |
| | 665 | GLASSWARE |
| | 666 | POTTERY |
| | 670 | REST OF 67 NOT DEFINED |
| | 671 | PIG IRON,SPIEGELEISN,ETC |
| | 672 | INGOTS ETC.IRON OR STEEL |
| | 673 | FLAT-ROLLED IRON ETC. |
| | 674 | FLAT-ROLLED PLATED IRON |
| | 675 | FLAT-ROLLED, ALLOY STEEL |
| | 676 | IRON,STL.BAR,SHAPES ETC. |
| | 677 | RAILWAY TRACK IRON,STEEL |
| | 678 | WIRE OF IRON OR STEEL |
| | 679 | TUBES,PIPES,ETC.IRON,STL |
| | 681 | SILVER,PLATINUM,ETC. |
| | 682 | COPPER |
| | 683 | NICKEL |
| | 684 | ALUMINIUM |
| | 685 | LEAD |
| | 686 | ZINC |
| | 687 | TIN |
| | 689 | MISC.NON-FERR.BASE METAL |
| | 691 | METALLIC STRUCTURES NES |
| | 692 | CONTAINERS,STORAGE,TRNSP |
| | 693 | WIRE PRODUCTS EXCL.ELECT |
| | 694 | NAILS,SCREWS,NUTS,ETC. |
| | 695 | TOOLS |
| | 696 | CUTLERY |
| | 697 | HOUSEHOLD EQUIPMENT,NES |
| | 699 | MANUFACTS.BASE METAL,NES |
| 8 Non-electric machinery | 711 | STEAM GENER. BOILERS,ETC. |
| | 712 | STEAM TURBINES |
| | 713 | INTRNL COMBUS PSTN ENGIN |
| | 714 | ENGINES,MOTORS NON-ELECT |
| | 716 | ROTATING ELECTRIC PLANT |
| | 718 | OTH.POWR.GENRTNG.MACHNRY |
| | 721 | AGRIC.MACHINES,EX.TRACTR |
| | 722 | TRACTORS |
| | 723 | CIVIL ENGINEERING EQUIPT |
| | 724 | TEXTILE,LEATHER MACHINES |
| | 725 | PAPER,PULP MILL MACHINES |
| | 726 | PRINTNG,BOOKBINDNG MACHS |
| | 727 | FOOD-PROCESS.MCH.NON DOM |
| | 728 | OTH.MACH,PTS,SPCL INDUST |
| | 731 | METAL REMOVAL WORK TOOLS |
| | 733 | MACH-TOOLS,METAL-WORKING |
| | 735 | PARTS,NES,FOR MACH-TOOLS |
| | 737 | METALWORKING MACHNRY NES |
| | 741 | HEATNG,COOLNG EQUIP,PART |

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| | 742 | PUMPS FOR LIQUIDS,PARTS |
| | 743 | PUMPS NES,CENTRIFUGS ETC |
| | 744 | MECHANICAL HANDLNG EQUIP |
| | 745 | OTH.NONELEC MCH,TOOL,NES |
| | 746 | BALL OR ROLLER BEARINGS |
| | 747 | TAPS,COCKS,VALVES,ETC. |
| | 748 | TRANSMISSIONS SHAFTS ETC |
| | 749 | NON-ELECT MACH.PARTS,ETC |
| 9 Computers, telecomm; cons. Electronics | 751 | OFFICE MACHINES |
| | 752 | AUTOMATC.DATA PROC.EQUIP |
| | 759 | PARTS,FOR OFFICE MACHINS |
| | 761 | TELEVISION RECEIVERS ETC |
| | 762 | RADIO-BROADCAST RECEIVER |
| | 763 | SOUND RECORDER,PHONOGRPH |
| | 764 | TELECOMM.EQUIP.PARTS NES |
| 10 Electronic components | 771 | ELECT POWER MACHNY.PARTS |
| | 772 | ELEC.SWITCH.RELAY.CIRCUT |
| | 773 | ELECTR DISTRIBT.EQPT NES |
| | 774 | ELECTRO-MEDCL,XRAY EQUIP |
| | 775 | DOM.ELEC,NON-ELEC.EQUIPT |
| | 776 | TRANSISTORS,VALVES,ETC. |
| | 778 | ELECTRIC.MACH.APPART.NES |
| 11 Transport equipment | 781 | PASS.MOTOR VEHCLS.EX.BUS |
| | 782 | GOODS,SPCL TRANSPORT VEH |
| | 783 | ROAD MOTOR VEHICLES NES |
| | 784 | PARTS,TRACTORS,MOTOR VEH |
| | 785 | CYCLES,MOTORCYCLES ETC. |
| | 786 | TRAILERS,SEMI-TRAILR,ETC |
| | 791 | RAILWAY VEHICLES.EQUIPNT |
| | 792 | AIRCRAFT,ASSOCTD.EQUIPNT |
| | 793 | SHIP,BOAT,FLOAT.STRUCTRS |
| 12 Clothing | 841 | MENS,BOYS CLOTHNG,X-KNIT |
| | 842 | WOMEN,GIRL CLOTHNG,XKNIT |
| | 843 | MENS,BOYS CLOTHING,KNIT |
| | 844 | WOMEN,GIRLS CLOTHNG.KNIT |
| | 845 | OTHR.TEXTILE APPAREL,NES |
| | 846 | CLOTHING ACCESSRS,FABRIC |
| | 848 | CLOTHNG,NONTXTL;HEADGEAR |
| 13 Misc. manufacturing | 811 | PREFABRICATED BUILDINGS |
| | 812 | PLUMBNG,SANITRY,EQPT.ETC |
| | 813 | LIGHTNG FIXTURES ETC.NES |
| | 871 | OPTICAL INSTRUMENTS,NES |
| | 872 | MEDICAL INSTRUMENTS NES |
| | 873 | METERS,COUNTERS,NES |
| | 874 | MEASURE,CONTROL INSTRMNT |
| | 881 | PHOTOGRAPH APPAR.ETC.NES |
| | 882 | PHOTO.CINEMATOGRPH.SUPPL |
| | 883 | CINE.FILM EXPOSD.DEVELPD |
| | 884 | OPTICAL GOODS NES |
| | 885 | WATCHES AND CLOCKS |
| | 891 | ARMS AND AMMUNITION |
| | 892 | PRINTED MATTER |
| | 893 | ARTICLES,NES,OF PLASTICS |
| | 894 | BABY CARRIAGE,TOYS,GAMES |
| | 895 | OFFICE,STATIONERY SUPPLS |
| | 896 | WORKS OF ART,ANTIQU ETC |
| | 897 | GOLD,SILVERWARE,JEWL NES |
| | 898 | MUSICAL INSTRUMENTS,ETC. |
| | 899 | MISC MANUFCTRD GOODS NES |

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| 14 Minerals | 272 | FERTILIZERS, CRUDE |
| | 273 | STONE, SAND AND GRAVEL |
| | 274 | SULPHUR, UNRSTD. IRON PYRS |
| | 277 | NATURAL ABRASIVES, NES |
| | 278 | OTHER CRUDE MINERALS |
| | 281 | IRON ORE, CONCENTRATES |
| | 282 | FERROUS WASTE AND SCRAP |
| | 283 | COPPER ORES, CONCENTRATES |
| | 284 | NICKEL ORES, CONCTR, MATTE |
| | 285 | ALUMINIUM ORE, CONCTR, ETC |
| | 286 | URANIUM, THORIUM ORES, ETC |
| | 287 | ORE, CONCENTR. BASE METALS |
| | 288 | NON-FERROUS WASTE, SCRAP |
| | 289 | PREC. METAL ORES, CONCTRTS |
| | 321 | COAL, NOT AGGLOMERATED |
| | 322 | BRIQUETTES, LIGNITE, PEAT |
| | 325 | COKE, SEMI-COKE, RET. CARBN |
| | 333 | PETROLEUM OILS, CRUDE |
| | 334 | PETROLEUM PRODUCTS |
| | 335 | RESIDUAL PETROL. PRODUCTS |
| | 342 | LIQUEFIED PROPANE, BUTANE |
| | 343 | NATURAL GAS |
| | 344 | PETROLEUM GASES, NES |
| | 345 | COAL GAS, WATER GAS, ETC. |
| | 351 | ELECTRIC CURRENT |
| | 667 | PEARLS, PRECIOUS STONES |
| Excluded | 269 | WORN CLOTHING, TEXTL. ARTL |
| | 911 | MAIL NOT CLASSED BY KIND |
| | 931 | SPEC. TRANSACT. NOT CLASSD |
| | 961 | COIN NONGOLD NONCURRENT |
| | 971 | GOLD, NONMONTRY EXCL ORES |

