TRADE COMPETITIVENESS MAP

Benchmarking national and sectoral trade performance

CONSISTENCY OF TRADE STATISTICS

Market Analysis and Research

Division of Market Development

International Trade Centre
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CHAPTER 1 – INTRODUCTION

1.1 Overview

Some sceptics consider trade statistics so unreliable that they simply disregard them as a source of information. This view is not borne out by the experience of ITC. Though trade statistics cannot provide precise information on traded values and quantities, they do indicate orders of magnitude. There are, of course, a few countries and a number of special products for which trade statistics are of little use. Moreover, it is essential to maintain efforts towards further improving the quality of trade statistics. Compared with most other economic data, however, merchandise trade statistics tend to be fairly reliable, as they are by-products of customs control. In contrast to statistics on value added production or savings, they relate to the movement of physical goods that have to pass through a limited number of ports, airports and other border stations, which are monitored by customs authorities.

Notwithstanding the attractiveness of this comprehensive source of information, users of database and applications based on trade statistics should take into account some of the weak points of foreign trade statistics.

Trade data are never complete. Smuggling and non-reporting represent a serious problem in a number of countries. In addition, trade statistics - as any source of information - are not free of mistakes and omissions.

Most countries include imports for re-exports and re-exports in their trade statistics. A low-income country may be an exporter of airplanes simply because its national airline has sold second-hand planes.

According to international conventions for reporting trade statistics, the export value refers to the total or contract value, which may, of course, be very different from local value added. For instance, for many processing activities, the local value added remains below 20 per cent of the export value.
Detailed trade statistics are available only for merchandise trade and not for services, although the latter may account for a sizeable share of national exports.

Even at the lowest level of disaggregation, product groups in the trade nomenclatures do not necessarily reflect trade names and often contain a wide spread of different products. Moreover, the product nomenclature is sometimes misleading. The labels of aggregated product groups are often very general and provide at times only limited guidance on the leading items within the group of products concerned.

Exchange rates fluctuations are not always properly recorded in international trade statistics. Values are normally aggregated over the period of one year in local currency and converted into US dollars.

For countries that do not report trade data to the United Nations, ITC uses partner country data, an approach referred to as mirror statistics. Mirror statistics are a second-best solution (better than having no data at all). At the same time, they have a number of shortcomings when compared to the first-best solution of nationally reported data. First and foremost, they do not cover trade with other non-reporting countries. As a result, mirror statistics hardly cover South-South trade. For an assessment of intra-African trade, for instance, mirror statistics are not a suitable source of information. Second, there is the problem of transhipments, which may hide the actual source of supply. Third, mirror statistics invert the reporting standards by valuing exports in CIF\(^1\) terms (i.e. including transport cost and insurance) and imports in FOB\(^2\) terms (excluding these items).

In view of the above shortcomings, trade statistics should never be the sole source of insight but need to be complemented by other sources, and in particular cross-checked by product specialists and industry insiders. Overall, ITC's experience suggests that trade statistics represent a very useful source of information and a valid point of departure for strategic market research, if analysed with a healthy mix of scepticism and pragmatism vis-à-vis their strength and shortcomings.

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\(^1\) **Cost, Insurance and Freight.**

\(^2\) **Free on Board.**
In order to tackle this issue of "unreliability" or inconsistency of trade statistics, ITC has developed two useful sources of information, which complement each other.

1. Technical notes on trade data
2. Indicators on consistency

These sources are both available on ITC’s Trade Competitiveness Map sub-site at http://www.intracen.org/ . While indicators on consistency show to which extent a country's trade data is consistent with its partner customs declarations (hence providing an assessment of discrepancies), technical notes on trade data try to explain why trade data reported by one country may be not reliable or inconsistent with other sources (including mirror estimates). Both sources of information try to highlight the products and partner countries with potential problems, regarding the analysis or the estimation of trade flows.

1.2 Why use Trade Competitiveness Map

The International Trade Centre UNCTAD/WTO (ITC) has developed from the previous Country Market Analysis Profiles (Country Map) the new Trade Competitiveness Map with the explicit objective of facilitating strategic market research, monitoring national trade performance and, designing and prioritizing the trade development programs of both the business sector and trade support institutions.

Trade Competitiveness Map addresses strategic market research from a country perspective and is available on ITC’s Internet Web site http://www.intracen.org. This Map includes a country’s Trade Performance Index, National Export Performance and National Import Profile, Foreign Investment Statistics, Trade Statistics and the Reliability of Trade Statistics.

Although the business community remains an indispensable source for such information, it does not always have readily available or unbiased answers. Some private consultancy firms gather large amounts of market research information,
which is available for a substantial fee. There is much information available in the public domain as well, if you know where to find it. However, the information and tools offered by ITC’s Trade Competitiveness Map is unique in terms of its coverage, methodological approach, and accessibility.

1.3 Product Nomenclature and Data Sources

1.3.1. Product Nomenclature

The “Consistency of Trade Statistics” module is based on the Harmonized System (HS) 1996 edition (data is arranged in four-digit level).

The Harmonized System is an international nomenclature for the classification of products published by the World Customs Organization (http://www.wcoomd.org). It allows participating countries to classify traded goods on a common basis for customs purposes. At the international level, the Harmonized System (HS) for classifying goods is a six-digit code system. The HS comprises approximately 5,300 article/product descriptions that appear as headings and subheadings, arranged in 99 chapters, grouped in 21 sections. The six digits can be broken down into three parts. The first two digits (HS-2) identify the chapter the goods are classified in, e.g. 09 = Coffee, Tea, Maté and Spices. The next two digits (HS-4) identify groupings within that chapter, e.g. 09.02 = Tea, whether or not flavoured. The next two digits (HS-6) are even more specific, e.g. 09.02.10 Green tea (not fermented)... Up to the HS-6 digit level, all countries classify products in the same way (a few exceptions exist where some countries apply old versions of the HS).

Beyond the six-digit level, the classification becomes national. Countries are free to introduce national distinctions for tariffs by adding more digits to make the HS classification of products even more specific. This greater level of specificity is referred to as the national tariff line level. For example, Canada adds another two digits to its exports and imports to classify them in greater depth, and the code 09023010 is the code for black tea, packaged as tea bags.
1.3.2. Sources of information

Different sources of information are contained in Trade Competitiveness Map. First, Trade Competitiveness Map is based on the world’s largest database of trade statistics, COMTRADE, maintained by the United Nations Statistics Division (UNSD) - http://unstats.un.org/unsd/comtrade. COMTRADE covers more than 90% of world trade or around 160 countries. Trade Competitiveness Map is able to present data for an even larger number of countries and territories (around 180) by using both reported and mirror statistics.

Reported data and mirrors statistics

Annual data is available not only for countries that report their own trade data, but also for the primarily low-income countries that do not report national trade statistics to COMTRADE.

When a country’s export data is not available, this study uses mirror statistics, i.e. amounts reported by the importing rather than exporting country. This approach has the advantage of covering the numerous non-reporting countries. At the same time, mirror statistics have some shortcomings which need to be taken into account. Firstly, contrary to international convention, these export data are expressed in C.I.F. terms, i.e. cost, insurance and freight are included. As a general rule, C.I.F. values tend to be about 10% higher than the free-on-board (F.O.B) values normally used for exports. Secondly, mirror statistics only capture those exports of non-reporting countries that are imports of the reporting countries. As a result, a major share of trade among developing countries is excluded.

1.4 Access to the tool

Thanks to financial contributions from World Bank and ITC’s Global Trust Fund, ITC has been able to provide free access to its market analysis tools to users in developing countries.
ITC is delighted to be able to respond to the growing demand for online access to its trade intelligence tools.

Users in developing countries and economies in transition, can register to ITC market analysis online tools through a common registration portal at http://legacy.intracen.org/marketanalysis/

For users in developed countries, the tools are available on a subscription basis. You may want to first register online for a one-week free trial to familiarise yourself with the tools. Please visit our web page for more information on subscription option and fees at http://legacy.intracen.org/marketanalysis/OptionsFees.aspx
CHAPTER 2 – HOW TO USE

2.1 How to enter the database

Figure 1. Intracen homepage which will grant you access to Trade Competitiveness Map.

By typing the URL address [http://www.intracen.org/](http://www.intracen.org/) into your Internet Address bar, you will access to the ITC homepage. On the top right corner of the page, you have the choice to switch from the English, to the French or Spanish version, and to choose the text size as well.

Hereinafter the screen shots will always be of the generic English version of the tool.
2.2 Country Profile

Figure 2. Country Profile

Once you select the country, you will be directed to the country’s profile page. This is the main selection menu from which you can choose the different analysis tools.

The menu items highlighted in Figure 2 above provide you with access to the lists of trade information sources and contacts concerning the country you selected, as well as access to graphs and trade and investment data.
Figure 3 shows the list of the different options relative to the Competitiveness Trade Map. We opened the different options relative to Trade and Investment Data.

Select the trade performance link you wish to visualize by clicking on the appropriate link as shown in the figure above. In this example, click on ‘Consistency of Trade Statistics’. This will automatically take you to the main interface of Trade Competitiveness Map for the selected option.

This guide will present the functioning of the “Consistency of Trade Statistics” module (from the export point of view). In order to have additional information on the other modules of Trade Competitiveness Map, please consult the respective downloadable User Guide.
CHAPTER 3 – CONSISTENCY OF TRADE STATISTICS

3.1 Purpose

As opposed to most economic data, such as production or consumption, there are usually two records for merchandise trade data, since transactions are both recorded by the customs offices in the exporting and the importing countries.

Hence, it is instructive to analyse the discrepancies between a country’s export statistics and the corresponding import statistics of its partner country (mirror estimate). An approximate match of trade statistics and their mirror statistics is a good sign of data reliability. Import figures should be slightly higher than export figures, as they include freight and insurance costs, although these costs obviously vary between products. An average difference of about 10% between import and export figures is the norm.

There are many reasons to have discrepancies, described in box 1 hereafter. However, in the context of high discrepancies, the trade analyst should question himself which data source is the best, if any. Consequently, the next step would be to look at information on the collection of trade data in the country under analysis. Looking at ITC’s technical notes on trade data or at the United Nations Statistics Division website (http://www.un.org/depts/unsd) could help him in this respect. The UNSD website contains very useful information on good practice in official statistics, methods and classification. It also contains information on national reporting practices in international merchandise trade statistics for around 140 countries.
Box 1: Sources of discrepancies

There are, of course, many reasons for discrepancies. For a complete description, see "Inconsistency between the reported imports and reported exports of trading partners: An overview of the reasons for discrepancy". Revised note by WTO, Task Force on International Trade statistics, Washington, March 1999. The different reasons can be regrouped as follows:

1. **Coverage and time of recording**, of which:
   a. Goods to be included or not (returned goods, vessels, emergency aid, military goods)
   b. Classification as goods or services (e.g. software)
   c. Statistical threshold values (e.g. intra-EU trade)
   d. Confidentiality (usually at the 6 digit level of the HS)
   e. Simplification
   f. Time lag in compilation (the time lag between the shipment and the arrival in the country of destination)
   g. Reference period (July-June or January-December)
   h. Illegal and unrecorded trade (ex: cut flowers in Uganda)

2. **Trade system** (General/Special Trade Systems)³

3. **Commodity classification** (same goods under different headings)

4. **Valuation**, of which
   a. CIF / FOB
   b. Currency conversions

5. **Quantity measurement** (gross-net, units)

6. **Partner country** (transit trade or re-exports)

7. **Errors and estimations**

The statistical territory in the General Trade System is broader than in the Special Trade System, since it includes both warehouses, commercial and industrial free zones, whereas in the strict version of the Special Trade System, the statistical

³ For more information on General and Special Trade Systems and the differences between the two, refer to [http://www.un.org/depts/unsd](http://www.un.org/depts/unsd)
territory is limited to the free circulation area of the country. Around 2/3 of the countries use the General Trade System.

In this context, it is often difficult to assess the origin and the final destination for goods that transit through one or even more countries. For example, many goods transit through Hong-Kong, Panama, Dubai (Emirates) or the Netherlands. Consequently, the Netherlands appear in the statistical databases as an exporter of bananas to other EU countries, while it is clear that there is no local production.

Another famous case is Hong Kong, which functions as a major “international marketing centre” for China, re-exporting Chinese production with an average margin of around 30%. Chinese producers are often not aware of the final destination of the products.
3.2 “Consistency of Trade Statistics” Main Menu

Figure 4 shows the interface of the “Consistency of Trade Statistics” module. It is composed of three drop-down menus that allow the user to select an object (Exports, Imports or both), Country/Industry and year that he wants to analyse, as well as the “options” links (Settings, Country metadata, Technical notes, Export data function).

On the other hand, Figure 5 shows the “Consistency of Trade Statistics” home page.

Before starting, the user has to choose what type of analysis he wishes to conduct. As for all modules of Trade Competitiveness Map, it is also possible with “Consistency of Trade Statistics” to analyse and compare, at the same time, one specific industry for all countries (Industry mode), or all industries of one single country (Country mode). In order to choose the mode, the user simply has to click on the relative button as shown in the figure below:

After choosing a mode of analysis, it is possible to consider the single domestic industry (single country) going from a 2-digit level analysis to a 4-digit one by simply clicking on the button at the beginning of every row of the results table.
In the “Country mode”, clicking on the first button next to one industry will open 4-digit results by that industry, while clicking on the second button will open results by partner countries for the selected industry.

<table>
<thead>
<tr>
<th>Industry</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All Industries</td>
<td></td>
</tr>
<tr>
<td>Boilers, machinery, nuclear reactors, etc</td>
<td></td>
</tr>
<tr>
<td>Vehicles other than railway, tramway</td>
<td></td>
</tr>
</tbody>
</table>

4-digit results for the respective industry

Results by partner countries for the respective industry

In the “Industry mode”, clicking on the first button next to one country will open 4-digit results by that industry for the country under review, while clicking on the second button will open results by partner countries for the selected industry.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>France</td>
</tr>
<tr>
<td>1</td>
<td>Canada</td>
</tr>
<tr>
<td>2</td>
<td>Germany</td>
</tr>
<tr>
<td>3</td>
<td>Australia</td>
</tr>
</tbody>
</table>

4-digit results for the selected country

Results by partner countries for the selected country
Figure 5. Consistency of Trade Statistics homepage

Consistency of Trade Statistics: Exports of Afghanistan (2009, in USD thousands)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Export value reported by country</th>
<th>Number of partner countries</th>
<th>Exports to the reporting partners</th>
<th>Number of reporting partners</th>
<th>Non-reported exports as %</th>
<th>Mirror estimates - Value</th>
<th>Mirror estimates - Number of partners</th>
<th>Measure of discrepancy - from detail (G=100 %)</th>
<th>Scoring of discrepancy Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 All Industries</td>
<td>405,435</td>
<td>30</td>
<td>324,671</td>
<td>13</td>
<td>18.7</td>
<td>1,267,728</td>
<td>09</td>
<td>86.2</td>
<td>High</td>
</tr>
<tr>
<td>03 Edible fruit, nuts, seed of citrus fruit, marmalade</td>
<td>101,978</td>
<td>22</td>
<td>173,674</td>
<td>13</td>
<td>4.6</td>
<td>120,680</td>
<td>22</td>
<td>42.0</td>
<td>High</td>
</tr>
<tr>
<td>03 Commodities not elsewhere specified</td>
<td>79,892</td>
<td>27</td>
<td>43,638</td>
<td>15</td>
<td>43.2</td>
<td>112,197</td>
<td>17</td>
<td>96.0</td>
<td>High</td>
</tr>
<tr>
<td>02 Textiles and other textile floor coverings</td>
<td>60,659</td>
<td>12</td>
<td>60,421</td>
<td>9</td>
<td>0.7</td>
<td>6,755</td>
<td>28</td>
<td>98.7</td>
<td>High</td>
</tr>
<tr>
<td>12 Oils, fats, edible fruits, grams, seed, fruit, etc.</td>
<td>31,905</td>
<td>7</td>
<td>6,077</td>
<td>3</td>
<td>75.0</td>
<td>15,233</td>
<td>17</td>
<td>85.7</td>
<td>High</td>
</tr>
<tr>
<td>13 Fats, greases, vegetable oils and extracts</td>
<td>30,289</td>
<td>13</td>
<td>25,215</td>
<td>7</td>
<td>10.0</td>
<td>22,002</td>
<td>3</td>
<td>40.5</td>
<td>High</td>
</tr>
<tr>
<td>09 Coffee, tea, mate and spices</td>
<td>6,006</td>
<td>5</td>
<td>5,952</td>
<td>3</td>
<td>17.9</td>
<td>8,305</td>
<td>8</td>
<td>85.6</td>
<td>High</td>
</tr>
<tr>
<td>09 Stone, clinker, cement, asbestos, silica, etc. articles</td>
<td>4,751</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>100.0</td>
<td>1,353</td>
<td>5</td>
<td>100.0</td>
<td>Very High</td>
</tr>
<tr>
<td>25 Sulfur, sulfur, earth, asbestos, lime and cement</td>
<td>557</td>
<td>2</td>
<td>457</td>
<td>1</td>
<td>10.0</td>
<td>1,353</td>
<td>8</td>
<td>93.3</td>
<td>High</td>
</tr>
<tr>
<td>42 Articles of leather, animal skin, harness, travel goods</td>
<td>161</td>
<td>2</td>
<td>189</td>
<td>1</td>
<td>0.6</td>
<td>111</td>
<td>8</td>
<td>100.0</td>
<td>Very High</td>
</tr>
<tr>
<td>04 Dairy products, eggs, honey, edible animal products</td>
<td>157</td>
<td>4</td>
<td>20</td>
<td>3</td>
<td>37.3</td>
<td>972</td>
<td>5</td>
<td>98.3</td>
<td>High</td>
</tr>
<tr>
<td>07 Edible vegetables and certain roots and tubers</td>
<td>136</td>
<td>4</td>
<td>135</td>
<td>3</td>
<td>0.7</td>
<td>21,642</td>
<td>11</td>
<td>98.8</td>
<td>High</td>
</tr>
</tbody>
</table>
CHAPTER 4 – CONSISTENCY INDICATORS

How reliable are your country’s trade statistics?

What are the special characteristics in the way a country reports its trade statistics that you should know?

4.1 Methodology

Trade statistics are a unique source of detailed, product-specific information on global markets, primarily because they are generated as a by-product of customs procedures. Yet, the reliability of trade data is far from perfect and users of trade data need to be aware of the shortcomings of the country- and product-specific data they analyze.

In support of users of trade data, ITC has established a facility that compares the two observations typically available for each trade flow, namely the data of both the exporting and importing countries. This section covers all countries reporting trade data to the UNSD COMTRADE database. For each of these countries, it provides four pages covering exports by leading products and exports by leading partner countries, as well as imports by leading products and imports by leading partner countries. Products are defined at the HS 2/HS 4-digit level.

It is worth mentioning the exclusion of a few reporting countries because these territories are characterised by a large share of re-exports and their inclusion in the sample would have generated additional noise of a systematic nature.
4.2 Description of the indicators

As mentioned in the previous paragraph consistency indicators\(^4\) are calculated at the 2/4-digit level of the HS for almost all countries reporting data to the UNSD COMTRADE database.

For each country, four tables have been constructed. Their purpose is to analyse both imports and exports by partner country and by major product.

The different indicators are briefly defined as follows:

- **EXPORT VALUE REPORTED BY COUNTRY**
  Exports to the sample countries, as reported by the country under review

- **NUMBER OF PARTNER COUNTRIES**
  Number of active importing countries (values > 0), according to the country’s statistics

- **EXPORTS TO THE REPORTING PARTNERS**
  Exports to countries that report their imports

- **NUMBER OF REPORTING PARTNERS**
  Number of active partner countries that report their imports

- **NON REPORTED EXPORTS AS %**
  Exports (as percentage) to the sample countries that do not report data (values reconstructed by mirror estimates)

- **MIRROR ESTIMATES – VALUE**
  Sum of the imports of the sample countries from the country under review (mirror estimate)

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\(^4\) Consistency means by asymmetry “Discrepancy” that reflects the gap in official trade statistics between two trading partner countries.
• **MIRROR ESTIMATES - NUMBER OF PARTNERS**
  Estimated number of active importing countries (values > 0)

• **MEASURE OF DISCREPANCY - FROM DETAIL**
  Discrepancy defined as ratio of the absolute difference in official trade statistics to total trade between two partner countries

• **SCORING OF DISCREPANCY**
  Measures the magnitude of discrepancy (Very Low, Low, Average, High, Very High)

**Examples**

Table 1 provides an example of consistency indicators for Pakistani exports.

We can see from the table that the situation in Pakistan is not negative. Considering all exporting industries, the score of discrepancy is medium, as there are some industries that are performing very well and some others that are very critical.

For example, data consistency for textile related industries (“Cotton”, “Other made textile articles, sets, worn clothing etc”) is very good while for others, like “Mineral fuels, oils, distillation products”, the performance is very negative.

On the other hand, Table 2 provides an example of consistency indicators for the “Products of animal origin, nes” industry.

We can conclude that the situation is quite different from country to country. Some countries are performing very well, while some others are doing less well, but there does not seem to be a geographical bias.

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5 Calculation of the measures of discrepancy, see the following sections.
Table 1. Example - Pakistan

<table>
<thead>
<tr>
<th>Industry</th>
<th>Export value reported by country</th>
<th>Number of partner countries</th>
<th>Exports to the reporting partners</th>
<th>Number of reporting partners</th>
<th>Non reported exports as %</th>
<th>Mirror estimates - Value</th>
<th>Mirror estimates - Number of partners</th>
<th>Measure of discrepancy - from detail</th>
<th>Scoring of discrepancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 - All industries</td>
<td>17,554,246</td>
<td>190</td>
<td>12,013,996</td>
<td>90</td>
<td>31.6</td>
<td>12,846,910</td>
<td>96</td>
<td>21.7</td>
<td>Average</td>
</tr>
<tr>
<td>52 - Cotton</td>
<td>3,203,790</td>
<td>145</td>
<td>2,258,495</td>
<td>83</td>
<td>29.5</td>
<td>2,430,989</td>
<td>84</td>
<td>13.2</td>
<td>Low</td>
</tr>
<tr>
<td>63 - Other made textile articles, sets, worn clothing etc</td>
<td>2,917,506</td>
<td>149</td>
<td>2,384,377</td>
<td>80</td>
<td>18.3</td>
<td>2,539,670</td>
<td>90</td>
<td>8.1</td>
<td>Very Low</td>
</tr>
<tr>
<td>10 - Cereals</td>
<td>1,823,218</td>
<td>122</td>
<td>678,232</td>
<td>65</td>
<td>62.8</td>
<td>572,797</td>
<td>66</td>
<td>22.5</td>
<td>Average</td>
</tr>
<tr>
<td>61 - Articles of apparel, accessories, knit or crochet</td>
<td>1,680,740</td>
<td>142</td>
<td>1,495,268</td>
<td>82</td>
<td>11</td>
<td>1,559,166</td>
<td>89</td>
<td>6.8</td>
<td>Very Low</td>
</tr>
<tr>
<td>62 - Articles of apparel, accessories, not knit or crochet</td>
<td>1,206,460</td>
<td>142</td>
<td>1,011,625</td>
<td>79</td>
<td>16.2</td>
<td>1,300,748</td>
<td>91</td>
<td>15.3</td>
<td>Low</td>
</tr>
<tr>
<td>27 - Mineral fuels, oils, distillation products, etc</td>
<td>714,571</td>
<td>18</td>
<td>457,255</td>
<td>9</td>
<td>36</td>
<td>103,593</td>
<td>17</td>
<td>81.3</td>
<td>High</td>
</tr>
</tbody>
</table>
### Table 2. Example - "Products of animal origin, nes" industry

<table>
<thead>
<tr>
<th>Country</th>
<th>Export value reported by country</th>
<th>Number of partner countries</th>
<th>Exports to the reporting partners</th>
<th>Number of reporting partners</th>
<th>Non reported exports as %</th>
<th>Mirror estimates - Value</th>
<th>Mirror estimates - Number of partners</th>
<th>Measure of discrepancy - from detail</th>
<th>Scoring of discrepancy Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1,217,600</td>
<td>101</td>
<td>786,820</td>
<td>67</td>
<td>35.4</td>
<td>872,946</td>
<td>69</td>
<td>20.6</td>
<td>Average</td>
</tr>
<tr>
<td>Germany</td>
<td>700,309</td>
<td>114</td>
<td>500,062</td>
<td>72</td>
<td>28.6</td>
<td>437,070</td>
<td>67</td>
<td>15.2</td>
<td>Low</td>
</tr>
<tr>
<td>Brazil</td>
<td>391,108</td>
<td>91</td>
<td>339,604</td>
<td>49</td>
<td>13.2</td>
<td>224,852</td>
<td>45</td>
<td>48.3</td>
<td>High</td>
</tr>
<tr>
<td>France</td>
<td>221,525</td>
<td>95</td>
<td>176,484</td>
<td>62</td>
<td>20.3</td>
<td>140,468</td>
<td>61</td>
<td>18.7</td>
<td>Low</td>
</tr>
<tr>
<td>New Zealand</td>
<td>217,771</td>
<td>77</td>
<td>183,195</td>
<td>49</td>
<td>15.9</td>
<td>117,065</td>
<td>51</td>
<td>41.5</td>
<td>High</td>
</tr>
<tr>
<td>Canada</td>
<td>173,175</td>
<td>101</td>
<td>152,357</td>
<td>65</td>
<td>12</td>
<td>142,092</td>
<td>65</td>
<td>9.4</td>
<td>Very Low</td>
</tr>
<tr>
<td>Taipei Chinese</td>
<td>125,100</td>
<td>42</td>
<td>44,337</td>
<td>27</td>
<td>64.6</td>
<td>53,216</td>
<td>31</td>
<td>19.6</td>
<td>Low</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>104,838</td>
<td>79</td>
<td>73,320</td>
<td>52</td>
<td>30.1</td>
<td>71,395</td>
<td>54</td>
<td>26.8</td>
<td>Average</td>
</tr>
</tbody>
</table>

The table shows the export value, number of partner countries, exports to the reporting partners, number of reporting partners, non-reported exports as a percentage, mirror estimates, number of reporting partners, measure of discrepancy from detail, and scoring of discrepancy exports for different countries.
4.3 Meaning and calculation of discrepancy measures

In order to determine the reliability of trade statistics, three different measures of discrepancy are calculated: simple, relative and from detail. However, to simplify the use of the application, the latter will only show the “discrepancy from detail”, because it provides more information than the other two indicators and allows the user to identify the critical areas where the analysis should be directed.

The meaning and calculation of the different various measures of discrepancy are briefly defined as follows:

- **Simple measure of discrepancy**

Defined as the difference between *mirror estimates* and *exports to the reporting partners*. It takes a value between \(-\infty\) and \(+\infty\). A positive (negative) value means that estimated exports are higher (lower) than recorded imports from partners countries.

The more the value of this indicator is far from zero, the less reliable the statistic will be. The user will have to investigate the possible causes of that.

- **Relative measure of discrepancy**

Defined as the ratio between *simple discrepancy* and the sum of *mirror estimates* and *exports to the reporting partners*:

\[
d = \frac{(C - B)}{(B + C)}
\]

The value of this indicator varies between \(-100\%\) \((C=0, B\neq0)\) and \(100\%\) \((B=0, C\neq0)\). If \(B\) (mirror estimates) is twice bigger than \(C\) (reported data) then the discrepancy = \(-33.3\%\) (for example, \((C-2C)/(C+2C))\). Since import statistics include freight and insurance costs, we usually can expect a positive value (close to 5%).

This indicator is calculated for all products at the 4/2-digit level of the Harmonized System and single results are aggregated.
The final value provides an overall picture of the reliability of trade statistics, but it is less indicative than the discrepancy given by the “from detail” one: the simple discrepancy is divided for a country’s total trade and this, in some cases, may strongly compensate different values (partner countries’ performance), with the consequence of getting an underestimated final result.

- **Measure of discrepancy from detail**

Defined as the relative deviations, the indicator is calculated as follows:

\[
d' = \frac{\sum_{i}^{n} |C_i - B_i|}{\sum_{i}^{n} (C_i + B_i)}
\]

\(B_i\) represents the exports of the country under review to country \(C\); \(C_i\) are country's \(i\) imports from the country under review, and \(n\) is the number of partner countries.

The value of this indicator varies between 0% and 100%. The lower the value of \(d'\), the lower the size of the discrepancies, and therefore, the higher the degree of consistency. For example, a value of 10% indicates a stronger level of consistency of trade statistics than a value of 20%.

This indicator is calculated for each trade partner and for all sectors at the 2/4-digit level of Harmonized System. Then single results are merged with a simple average.

The final value provides a more precise picture on trade statistics’ reliability than the relative discrepancy’s one: the simple discrepancy is calculated for bilateral relations and divided for bilateral trade and this, eliminating the problem of underestimation, gives an accurate final result.

Basically, high values of this index indicate problems with specific countries and, once these countries identified, the user could direct the analysis to find possible causes of these situations.
4.4 The Scoring Process

To understand the discrepancy level, a qualitative index is calculated: “Scoring of Discrepancy”. The scoring process behind this indicator is defined as follows:

1. If Indicator < 0.1 then Scoring = 5; Very Low;
2. Else if Indicator < 0.2 then Scoring = 4; Low;
3. Else if Indicator < 0.3 then Scoring = 3; Average or Medium;
4. Else if Indicator < 0.4 then Scoring = 2; High;
5. Else if 0.4 < Indicator ≤ 1 then Scoring = 1; Very High.

Possible reasons for trade statistics discrepancy

There can be multiple sources of discrepancy of trade statistics. The main ones are related to differences in the recording system, to registration errors, and to the exchange rate effect.

- Differences in the recording system: these are due to various factors such as inclusion or exclusion of particular commodities, timing (time of recording), including valuation (Imports CIF, Exports FOB).

- Registration errors: these are problems related to the treatment of low-value transactions, unregistered cross-border trade (for example Africa informal trade), missing or incomplete information (commodity classification), quantity measurement and partner country, and the intentionally incorrect reporting to avoid tariffs and quotas. Some countries do not register below a threshold (JPN, CAN, AUS, etc).

- The “Exchange Rate” effect: this effect consists in a distortion in the estimation of exports due to an unexpected change in the currency exchange rate that causes significant changes in the trade flows.

- Geographic Coverage: problems could occur if a country includes (or not) some geographical areas in the count of trade statistic. For example, the United States includes trade with Puerto Rico and the U.S. Virgin Islands in its merchandise trade statistics. In contrast, Mexico treats them as separate trading partners.

6 See Box 2.
Similar problems occur with China and its administrative provinces (Hong Kong, Taipei, Macau etc).

- Non-filing of exports: single national export regulations may require the reporting of all export transactions valued over a certain value. Some companies, however, do not submit all the required declarations, especially companies exporting out of foreign trade zones.

- Low value transactions: some countries do not include transactions valued below a certain value in their export trade statistics, while others record instead all trade transactions, regardless of value.

Box 2. What do CIF and FOB mean?

FOB (free on board) means the seller’s obligation to deliver is fulfilled when the goods have passed over the ship’s rail at the named port of shipment. Then the buyer has to bear all costs and risks of loss or of damage to goods from that named point.

CIF (Cost including insurance and freight) means the seller must pay the costs and freight necessary to bring the goods to named port of destination, but the risk of loss or of damage to the goods, as well as any additional costs due to events occurring after the time the goods have been delivered on board vessel, is transferred from the seller to the buyer when the goods pass the ship’s rail in the port of shipment. In addition, the seller has to procure marine insurance against the buyer’s risk of loss or of damage to goods during the carriage. The seller contracts for insurance and pays the insurance premium.