

Trade Performance Indicators

Introduction

Trade policy is often based on principles, but quantitative measures are very important to assess its performance, evaluate its potential consequences and identify areas where further research should be undertaken. For example, a good understanding of trade indicators will help determine how a country should negotiate trade agreements with its partners. Also, theory often suggests mechanisms that work in opposite directions; the net impact is then an empirical question, to which trade indicators can provide an answer.

The basic notations will first be described. An explanation of the indicators important in analyzing trade performance is then followed by an example illustrating a way to compute them. Exercises are also provided along with their solutions.

Some basic notation

When looking at trade flows, there are essentially 3 elements that need to be taken into account:

1. the commodity
2. the supplying country
3. the receiving country

On occasion we want to distinguish the value of the commodity, the price and the quantity. Values might be current or constant price. We generally deal with constant price values.

We should note that although theory often treats export flows from country A to country B as identical to imports by country B from A, in practice these are not always the same because there will be some transport and trade margins – the difference between fob and cif. (In addition there are statistical discrepancies in reporting so that even after accounting for margins, an export reported by one country will not match the imports reported by the receiving country).

Concerning the Exports, we will show the three elements by using 3 subscripts, always in the order of supplier, buyer and commodity, with i and j representing each a country and k symbolising a commodity. So x_{ijk} represents the value of the flow of good k from country i to country j .

We can then show different aggregate flows by summing over different indices or groups of indices. It is sometimes convenient to leave out the summation signs. We will then use

uppercase letters, with the missing subscript referring to the domain of the summation. We then have the following consistent notation:

x_{ijk}	exports of commodity k from country i to country j
X_{ij}	total exports of all commodities from i to j
X_{ik}	total exports to all destinations of k from i
X_j	total exports of all commodities to all destinations by j
X_i	total exports of all commodities to all destinations by i
X_k	total world exports of k
X_w	total world exports of all commodities from all countries

When talking about imports, similar notations will be used but now:

m_{ijk}	imports of commodity k from country j by country i
M_{ij}	total imports of all commodities from j by i
M_{ik}	total imports from all origins of k by i
M_j	total imports of all commodities from all origins by j
M_i	total imports of all commodities from all origins by i
M_k	total world imports of k
M_w	total world imports of all commodities from all countries

Description of the indicators

Import intensity index

This indicator helps to establish whether a country is importing more or less than it normally would from another trading partner.

The import intensity index of country i from country j noted here as imp_{ij} can be calculated on an aggregate bilateral level with the following formula:

$$imp_{ij} = \frac{\left[\frac{M_{ij}}{M_i} \right]}{\left[\frac{X_j}{X_w - X_i} \right]} = \frac{\text{share of imports from } j \text{ in total imports of } i}{\text{share of } j \text{ in total world exports excluding } i\text{'s exports}}$$

M_{ij}	= total imports of country i from country j
M_i	= total imports of country i
X_i, X_j	= total exports of i and j
X_w	= total world trade

$\frac{M_{ij}}{M_i}$ establishes the importance of country j as a supplier of country i .

$\frac{X_j}{X_w - X_i}$ establishes the importance of country j as a supplier to the world.

The result of the preceding calculations can then be interpreted as follows:

The result will show how the share of country i imports originating from country j compares to the share of country j exports in total world trade, in other words, how it compares to the share of total world imports originating from j . If there are no bias, imp_{ij} should be equal to 1, meaning that the share of products i imports from j is equal to the share of j in world imports. A ratio smaller than 1 means that country i is importing less from country j than could be expected from the world average and that it has a bias against j . A ratio higher than 1 means that country i imports from j are higher than expected and it is therefore biased in favor of country j .

$imp_{ij} < 1 \rightarrow$ bias against j

$imp_{ij} = 1 \rightarrow$ no bias

$imp_{ij} > 1 \rightarrow$ bias in favour of j

Export intensity index

This indicator helps to establish whether a country is exporting more than it normally would to another trading partner.

It can be calculated on an aggregate bilateral level with the following formula:

$$ex_{ij} = \frac{\left[\frac{X_{ij}}{X_i} \right]}{\left[\frac{M_j}{M_w - M_i} \right]} = \frac{\text{Share of imports of country } j \text{ from country } i}{\text{Share of } j \text{ in total world imports}}$$

X_{ij} = total exports of country i to country j

X_i = total exports of country i

M_i, M_j = total imports of i and j

M_w = total world trade

$\frac{X_{ij}}{X_i}$ establishes the importance of country j as a consumer to country i .

$\frac{M_j}{(M_w - M_i)}$ establishes the importance of country j as a consumer to the world.

The result will show how the share of country i exports imported by country j compares to the share of country j imports in total world trade, in other words, how it compares to the share of total world exports imported by j . If there are no bias, ex_{ij} should be equal to 1, meaning that the share of country i exports imported by j is equal to the share of world exports imported by j . A ratio smaller than 1 means that country i is exporting less to country j than could be expected from the world average and that there is a bias against i . A ratio higher than 1 means that country i exports to j are higher than expected and there is therefore biased in favor of country i .

$ex_{ij} < 1 \rightarrow$ bias against i

$ex_{ij} = 1 \rightarrow$ no bias

$ex_{ij} > 1 \rightarrow$ bias in favour of i

Revealed comparative advantage (RCA)

The RCA is an index, which helps to determine whether a country has a comparative advantage in a specific category of products.

To establish whether a country has a comparative advantage in a particular good would require looking at resource intensities of all goods in all countries. But a comparative advantage can be “revealed” by trade patterns. If a country has a CA in a good, that good should be more important in its trade than it is in world trade.

It can be calculated using the following formula:

$$RCA_{ik} = \frac{\left[\frac{X_{ik}}{X_i} \right]}{\left[\frac{X_k}{X} \right]} = \frac{\text{Share of commodity } k \text{ in country } i\text{'s exports}}{\text{Share of commodity } k \text{ in world trade}}$$

X_{ik} = exports of commodity k by country i

X_i = total exports of country i

X_k = total world trade in commodity k

X = total world trade

$\frac{X_{ik}}{X_i}$ establishes the importance of commodity k in country i 's exports.

$\frac{X_k}{X}$ establishes the importance of commodity k in world trade.

If commodity k represents a higher share country i exports than commodity k 's share of world exports, the index will be higher than 1 and country i can be said to have a Revealed Comparative Advantage in commodity k as it is exporting more of that product than one would have expected from the world average.

If the index is equal to 1, it means that the two ratios are equal and country i does not enjoy a RCA in commodity k .

If the index is smaller than 1, k represents a smaller share of country i exports than expected from world average and country i can be said to have a comparative disadvantage in commodity k .

An alternative formulation is:

$$RCA_{ik} = \frac{\left[\frac{X_{ik}}{X_k} \right]}{\left[\frac{X_i}{X} \right]} = \frac{\text{Share of country } i \text{ in world trade of commodity } k}{\text{Share of country } i \text{ in world trade}}$$

$\frac{X_{ik}}{X_k}$ establishes the share of country i in world trade of commodity k and

$\frac{X_i}{X}$ establishes the share of country i in world trade.

According to this alternative formulation, the share of country i in world trade of commodity k is compared to the overall share of country i in world trade. If the index is smaller than one, it means that the share of country i in world trade of commodity k is smaller than its overall share of world trade and country i is having a comparative disadvantage in commodity k .

If the two ratios are equal, the index will be smaller equal to 1 and country i is not enjoying a RCA in commodity k .

If country i has a higher share of world exports in commodity k than its overall share of world exports, the index will be higher than 1 and country i has a RCA in commodity k .

In summary, the RCA_{ik} index can be interpreted as follow:

$RCA_{ik} < 1 \rightarrow$ Comparative disadvantage in k

$RCA_{ik} = 1 \rightarrow$ no CA in k

$RCA_{ik} > 1 \rightarrow$ CA in k

Revealed Trade barriers (RTB)

An analysis of a country's trade patterns can reveal barriers to trade that would not have been identified by simply looking at the official tariff rates.

In order to calculate the RTB index, one can simply take the ratio of the share of commodity k in country i imports from country j by the share of commodity k in world imports.

If the share of commodity k in country i imports from country j is lower than the share of commodity k in world imports, it means country i is importing less k from country j than could be expected from general trends and it is probably discriminating against imports of k from country j .

If the shares are equal, the index will be 1 and there is no discrimination involved.

When i is importing more from j than expected, the index will be higher than 1 and country i might actually be giving preferential treatment to imports of product k from country j .

The index can thus be calculated using the following formula:

$$RTB_{ik} = \frac{\left[\frac{m_{ijk}}{M_{ij}} \right]}{\left[\frac{M_k}{M} \right]}$$

$\frac{m_{ijk}}{M_{ij}}$ is the share of commodity k in country i imports from country j

$\frac{M_k}{M}$ is the share of commodity k in world imports.

m_{ijk}	= imports of commodity k from country i by country j
M_{ij}	= total imports from country i by country j
M_k	= total world imports of commodity k
M	= total world imports

The results can then be interpreted as follow:

$RTB_{ik} < 1 \rightarrow$ possibly discrimination against k from i in j

$RTB_{ik} = 1 \rightarrow$ no discriminatory trade barrier against k from i in j
 $RTB_{ik} > 1 \rightarrow$ possibly preferential treatment of k from i in j

Intra-Industry Trade indices

These indices are useful to determine what percentage of trade between two countries is intra-industry and which industries engage in the most intra-industry trade. It is equal to total trade less net trade, all divided by total trade:

$$IIT = \frac{[(x_{ijk} + m_{ijk}) - ABS(x_{ijk} + m_{ijk})]}{[x_{ijk} + m_{ijk}]} * 100$$

More

<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPINTECOTRA/0,,contentMDK:20551648~pagePK:34004173~piPK:34003707~theSitePK:580005.00.html#3>

Example

Exercise

Solution