Technical notes on definitions, methods of calculations and data sources for trade indicators in APTIAD

This note contains the basic definitions and formulae for calculation of indices of trade performance for selected trade agreements in Asia and the Pacific. The indicators currently featured include:
Export Dependence
Import Dependence
Trade Dependence (Openness)
Trade Balance
Normalized Trade Balance
Intraregional Export, Import and Trade Shares

Not all of the above indicators are available for all the trade agreements due to data limitations. The indicators are calculated using time series (SITC Rev 3) COMTRADE data from 2001 to 2005 for the preferential trade agreements in the region. The data for the national Gross Domestic Product (GDP) data is sourced from the World Development Indicators on-line database, for the years from 2001 to 2005. All data is in current USD values. The date of last update is 30 April 2007.

1. Export Dependence

Definition

For a single country, export dependence shows the degree of reliance among domestic producers on foreign markets. It is measured by dividing exports (X) by Gross Domestic Product (GDP) and expressing the ratio as a percentage. For the preferential trade agreement (PTA), exports are sum of exports of PTA's members and the GDP is the sum of each PTA member's GDP. Exports are either intraregional exports for the given PTA or total exports of the PTA members. It is defined:

$$XD = \frac{\sum_{k=1}^{n} X_k}{\sum_{k=1}^{n} GDP_k} \bullet 100$$

where *k* stands for a country, *n* is total number of countries participating in the PTA. This indicator can be measured also for individual products or sectors, depending on disaggregation of trade and/or GDP data.

Range of Values

Values of this index range from 0 (with no exports) to + ∞ (with GDP being zero), and the index is expressed in per cent. It is very unlikely that either bound of {0, + ∞} will be approximated in real world. In some case economies engage in re-export which tend to increase the value of index. The indicator tends to be biased also by the size of countries (GDP).

2. Import Dependence

Definition

For a single country, import dependence indicates a contribution by foreign supply to GDP. It is measured by dividing imports (M) by Gross Domestic Product (GDP) and expressing the ratio as a percentage. GDP is the sum of each PTA member's GDP. Imports are the sum of either intraregional imports for the given PTA or total imports of the PTA members. It is defined:

$$MD = \frac{\sum_{k=1}^{n} M_k}{\sum_{k=1}^{n} GDP_k} \bullet 100$$

where *k* stands for a country, *n* is total number of countries participating in the PTA. This indicator can be measured also for individual products or sectors, depending on disaggregation of trade and/or GDP data.

Range of Values

Values of this index range from 0 (with no imports) to + ∞ (with GDP being zero), and the index is expressed in per cent. It is very unlikely that either bound of {0, + ∞} will be approximated in real world. The indicator tends to be biased also by the size of countries (GDP).

3. Trade Dependence

Definition

For a single country, trade dependence represents the combined weight of exports and imports in an economy. This trade-to-GDP ratio is often called the "trade openness" indicator. However, using this indicator as a representation of openness could be misleading. Even when this indicator has a relatively small value, it does not necessarily imply high trade barriers. It may, in fact, be caused by a large proportion of GDP being created by non-traded activities and other factors. It is not possible to evaluate trade regimes as "open" or "closed" on the basis of this indicator alone. Trade dependence is defined:

$$TD = \frac{\sum_{k=1}^{n}(X_k + M_k)}{\sum_{k=1}^{n} GDP_k} \bullet 100$$

where *k* stands for a country, *n* is total number of countries participating in the PTA. This indicator can be measured also for individual products or sectors, depending on disaggregation of trade and/or GDP data.

Range of Values

Values of this index range from 0 (with no trade) to + ∞ (with GDP being zero), and the index is expressed in per cent. It is very unlikely that either bound of {0, + ∞} will be approximated in real world. The sizes of countries (GDP) also tend to bias the value of the index. Where economies engage in re-export, the value of trade might increase above the GDP and pushes the value of the index above 100%.

4. Trade Balance

Trade balance is the difference between exports and imports and can be measured at either intraregional level or the total level. It is expressed in millions of current USD. It is defined:

$$TB = \sum_{k=1}^{n} X_k - \sum_{k=1}^{n} M_k$$

Range of Values

This index is 0 when exports equal imports; otherwise it takes positive or negative value of the difference between the two.

5. Normalized Trade Balance

Normalized trade balance relates the difference between exports and imports to total trade, and is a measure of trade performance. The indicators are given at the intraregional (PTA) level and for the total exports and imports.

$$NTB = \frac{\sum_{k=1}^{n}(X_k - M_k)}{\sum_{k=1}^{n}(X_k + M_k)} \bullet 100$$

Range of Values

Typically, normalized values range between -1 and +1, but are expressed here as a percentage of the sum of exports and imports.

6. Intraregional Export Shares

Definition

Intraregional exports as shares of total exports of the PTA members provide a useful overview of changes in the basic structure of the geographic pattern of exports and when combined with import shares of trade in general. It is defined:

$$XS = \frac{\sum_{k=1}^{n} X_k^R}{\sum_{k=1}^{n} X_k} \bullet 100$$

where *k* is a country, *R* intraregional destination of exports, and *n* total number of countries participating in the PTA. This indicator can be measured for an individual product or a sector depending on disaggregation of trade data.

Range of Values

Values range between 0 (no intraregional exports) and 100 and are expressed as percentages.

7. Intraregional Imports Shares

Definition

Intraregional imports as shares of total imports of the PTA members provide a useful overview of changes in the basic structure of the geographic pattern of imports and when combined with export shares of trade in general. It is defined:

$$MS = \frac{\sum_{k=1}^{n} M_k^R}{\sum_{k=1}^{n} M_k} \bullet 100$$

where *k* is a country, *R* intraregional source of imports, and *n* total number of countries participating in the PTA. This indicator can be measured for an individual product or a sector depending on disaggregation of trade data.

Range of Values

Values range between 0 (no intraregional exports) and 100 and are expressed as percentages.

8. Intraregional Trade Shares

Definition

Intraregional trade as a share of total trade of the PTA members provides a useful overview of changes in the basic structure of the geographic pattern of trade. It is defined:

$$TS = \frac{\sum_{k=1}^{n} T_k^R}{\sum_{k=1}^{n} T_k} \bullet 100$$

where *k* is a country, *R* intraregional destination and source of trade (T), and *n* total number of countries participating in the PTA. This indicator can be measured for an individual product or a sector depending on disaggregation of trade data.

Range of Values

Values range between 0 (no intraregional exports) and 100 and are expressed as percentages.

Note: Other trade indicators which will be available from this database will include measures of:
Complementarity
Competitiveness
Hirschman - Regional Concentration
Hirschman - Sectoral Concentration
Measures of IIT Changes
Regional Orientation
Revealed Comparative Advantage
Trade Intensity

Their definitions and methods of calculation will be provided in a separate technical note.