

A further distinguishing characteristic of intra-industry trade is that it enhances the gains from trade through better exploitation of economies of scale - rather than through comparative advantage - as trade leads countries to concentrate on a limited number of products within any particular industry. This leads to an expansion of world output because of the saving of fixed costs.

Specialization within industrial categories may also stimulate innovation. Producing a greater variety and number of goods increases the general knowledge about technology, and greater knowledge implies smaller costs of knowledge accumulation. For example, U.S. importation of Japanese cars and trucks over the years has led to improvements in U.S. car and truck manufacturers.

Finally, intra-industry trade reduces the demands for protection because in any industry there are both exports and imports, making it difficult to achieve unanimity among those demanding protection.

### Measurement of IIT<sup>6</sup>

Most empirical studies use the Grubel and Lloyd's index (GL) as a measure of the extent of intra-industry trade:

$$GL_{ijkt} = \frac{(X_{ijkt} + M_{ijkt}) - |X_{ijkt} - M_{ijkt}|}{(X_{ijkt} + M_{ijkt})} \times 100 = 100 - \frac{|X_{ijkt} - M_{ijkt}|}{(X_{ijkt} + M_{ijkt})} \times 100, \quad (1)$$

where  $GL_{ijkt}$  is the intra-industry trade index of industry  $i$  with the partner  $k$  in the year  $t$ , and  $X_{ijkt}$  and  $M_{ijkt}$  are exports and imports of the category  $j$  pertaining to the industry  $i$  with the partner  $k$  in year  $t$ . Adjusted for the categorical aggregation, the intra-industry trade index becomes:

$$IIT_{ikt} = \sum_{j=1}^n GL_{ijkt} = \frac{\sum_{j=1}^n (X_{ijkt} + M_{ijkt}) - \sum_{j=1}^n |X_{ijkt} - M_{ijkt}|}{\sum_{j=1}^n (X_{ijkt} + M_{ijkt})} \times 100 \quad (2)$$

If trade is only in different goods, either  $X_{ijkt} = 0$  or  $M_{ijkt} = 0$  and  $IIT_{ikt}$  equals zero. On the other hand, if trade in only similar goods takes place e.g.  $X_{ijkt} = M_{ijkt}$ , then  $IIT_{ikt}$  equals 100. The closer the value of the index to 100 the greater is the degree of intra-industry trade. It is worth noting that the IIT index is influenced by the size of the trade imbalance. The greater trade imbalance (deficit or surplus), the smaller the value of the measured index.

It has been argued that IIT would not exist at the finest level of disaggregation and that it is a statistical illusion arising from an improper geographic or sectoral aggregation. Put differently, the lesser the detail of the disaggregation used, i.e., the more products are lumped together into a single industry, the more trade is measured as being an intra-industry type. While there may be some truth in this view, sufficient empirical evidence is now available to suggest that disaggregation does not cause IIT to disappear.<sup>7</sup> Moreover, at the finest level of disaggregation (e.g. HS-6), intra-industry trade might be underestimated because very similar goods that are produced using the same inputs are being classified as different commodities (Brown and Anderson (1999)).<sup>8</sup> To some extent, trade data become less representative of an industry.

<sup>6</sup> The reader might skip this part of the box without losing understanding of the results and conclusion.

<sup>7</sup> IIT persists even at the eight-digit United States Standard Industry classification.

<sup>8</sup> Brown, W.M. and W.P. Anderson (1999). The Influence of Industrial and Spatial Structure on Canada-US Regional Trade. Growth and Change, 30, 23-47.