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## CHAPTER 4

### Intra-Industry Trade (Revised)

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Once, while visiting the World Trade Organization in Geneva, I took a three-day side trip to Cleremont-Ferrand, France in order to visit some students who were on study abroad there. At my first buffet breakfast in the hotel, I noticed an exceptional-looking blue cheese. It was as exceptional to eat as to look at, and upon my inquiry, I learned that this was the famed *blue d’Auvergne* from the surrounding region.<sup>1</sup> I ate as much of it as I could during my short trip, and upon my return to the United States, began to purchase it whenever possible. In this way, I began to contribute to the total volume of cheese imports of the United States. It turns out, however, that the United States also *exports* cheese, especially what is known as “food-service” cheese (admittedly less exceptional than the *blue d’Auvergne*). Thus, the United States *both imports and exports* cheese, a phenomenon known as ***intra-industry trade***.

In this chapter, you will begin to appreciate this important type of trade. You will also understand how it differs from ***inter-industry trade***, why it occurs, and its role in the world economy. In order to understand *intra*-industry trade, we will draw on the analytical elements of countries, sectors and tasks. We begin by contrasting *inter*- and *intra*-industry trade.

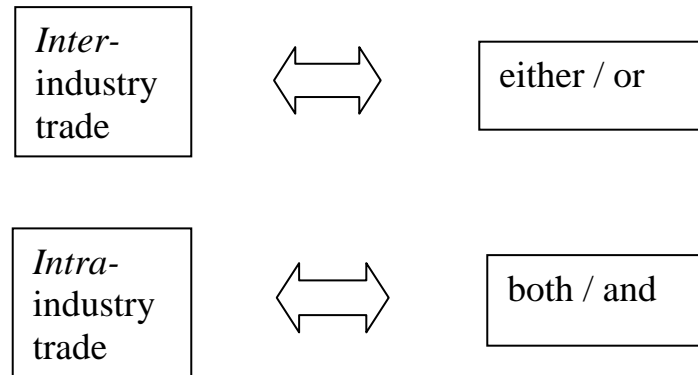
#### ***Intra-Industry and Inter-Industry Trade***

In Chapter 3, we discussed the important concept of **comparative advantage**. In our example of that chapter, we saw that Japan imported rice and exported motorcycles, while Vietnam exported rice and imported motorcycles. This is an example of how comparative advantage is associated with *inter*-industry trade. In *inter*-industry trade, a country *either imports or exports* a given product. Our example above of US cheese trade is quite different. The United States *both imports and exports* cheese. Therefore, you should have the

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<sup>1</sup> The term *blue d’Auvergne* is one example of what is known as a *regional indicator* in international trade law. We will encounter regional indicators in our discussion of intellectual property in Chapter 7.

following associations in mind when distinguishing *intra*-industry trade from *inter*-industry trade:



As we just mentioned, and as indicated in Table 4.1, *inter*-industry trade has its source in comparative advantage, in the differences in technology and factor endowments of countries. *Intra*-industry trade and its sources are different, and there are actually two types of *intra*-industry trade. The example of trade in cheese varieties is a case of *horizontal intra*-industry trade and has its source in **product differentiation**. The term “horizontal” refers to the fact that the products exchanged are at the same level of processing. That is, both the exported variety (food service cheese) and the imported variety (*blue d’Auvergne*) are final goods. The role of product differential here is that the two varieties of cheese are different from one another. The final product *blue d’Auvergne* is not the same kind of product as food-service cheese or Wisconsin cheddar. Similarly, the final product Ford Focus is not exactly the same kind of product as a Honda Civic.<sup>2</sup>

The second type of *intra*-industry trade is *vertical intra*-industry trade and has its source in **fragmentation** (again, see Table 4.1). For example, China imports computer components and assembles them into the final product computers. The imported computer components are at a previous stage of processing than the exported computers, but from the point of view of computer products, this is *intra*-industry trade. The reason this has occurred is that firms have decided to break up the production process of computers into tasks or fragments and distribute them across national boundaries. This fragmentation is an example of what we called international production in Chapter 1, and vertical *intra*-industry trade is one area where the windows of international trade and international production interact in an important way. Indeed, another term for fragmentation is “international production sharing.”<sup>3</sup> This is a relatively new phenomenon and has shown up in the increased volumes of parts and components in international trade flows.

<sup>2</sup> As stated by van Marrewijk (2002), “A satisfactory theoretical explanation (of *intra*-industry trade) should... be able to distinguish between goods and services which are close, but imperfect substitutes” (p. 183).

<sup>3</sup> See, for example, Arndt (2009). Arndt rightly notes that there are important connections between fragmentation and foreign direct investment. Indeed, some *vertical intra*-industry trade

Table 4.1. Types of Trade

Type of Trade	Phrase	Meaning	Source
<i>Inter</i> -industry	Either/or	<i>Either</i> imports <i>or</i> exports in a given sector of the economy	Comparative advantage
<i>Horizontal intra</i> -industry	Both/and/same	<i>Both</i> imports <i>and</i> exports in a given sector of the economy and at the <i>same</i> stage of processing	Product differentiation
<i>Vertical intra</i> -industry	Both/and/different	<i>Both</i> imports <i>and</i> exports in a given sector of the economy and at <i>different</i> stages of processing	Fragmentation (comparative advantage in some instances)

There is another subtle issue associated with *vertical intra*-industry trade. Some types of fragmentation take place so that final assembly will occur where there is abundant, inexpensive labor. This sounds a lot like the comparative advantage story we discussed in Chapter 3. While these issues are still being fully worked out by trade theorists, there is agreement that some part of fragmentation is comparative advantage working in a *new way*, within the realm of parts and components rather than final goods. So, while comparative advantage is not much help in explaining *horizontal intra*-industry trade, it is of help in explaining some types of *vertical intra*-industry trade.<sup>4</sup>

Globally, *intra*-industry trade is becoming more important over time. In the next section, we will examine the global pattern of this type of trade. Then we will consider more formal explanations of how and why this type of trade occurs.

### Global Patterns of *Intra*-Industry Trade

Estimates of the amount of *intra*-industry trade vary and depend both on the measurement technique and the level of disaggregation of the trade data. As discussed in the appendix, the more disaggregated are the trade data, the less the measured amount of *intra*-industry trade. One comprehensive assessment of global *intra*-industry trade is that of Brühlhart (2009). His estimates are presented in Figure 4.1. This figure shows that, measured at the 5-digit

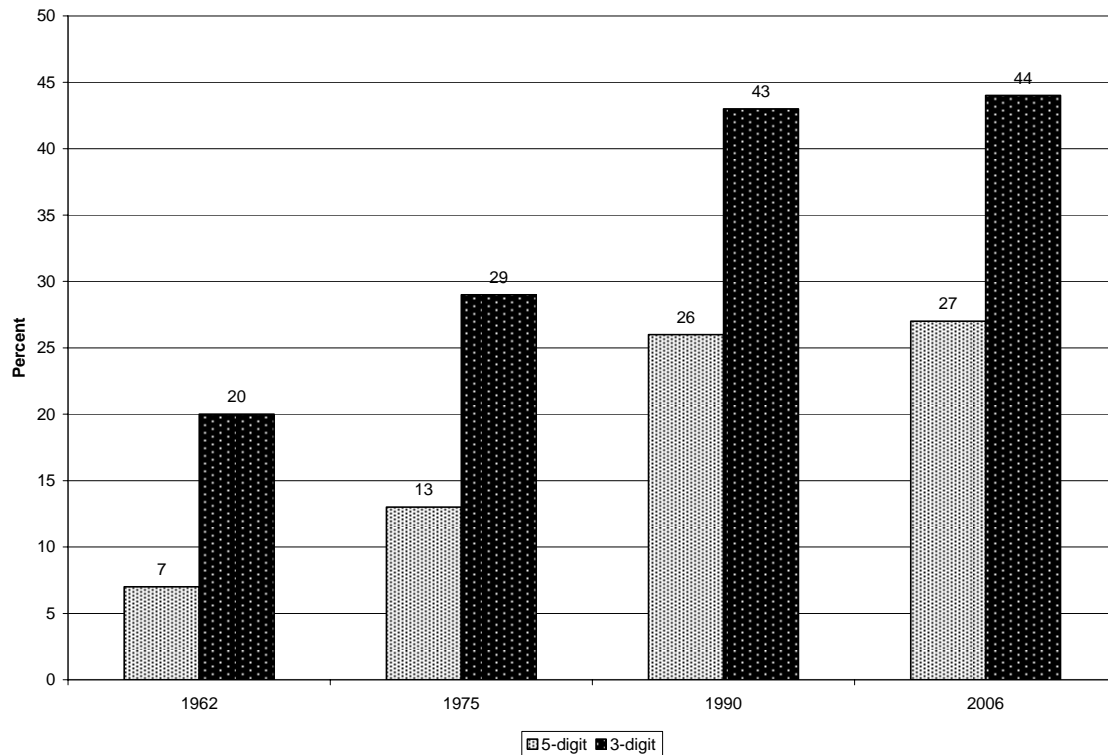
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can also be *intra*-firm trade within a multinational enterprise. As the OECD (2002) states: “The combination of rising *intra*-industry trade and high foreign direct investment inflows (in some countries) is consistent with the increasing extent to which multinational firms have located parts of their production operations in these countries” (p. 162).

<sup>4</sup> One reason why comparative advantage does not explain all *vertical intra*-industry trade is that, for this kind of trade involving a series of tasks located in different countries, proximity to transportation and logistics hubs can also be important.

Standard Industrial Trade Classification (SITC) level, *intra*-industry trade increased from seven percent of world trade in 1962 to 27 percent of world trade in 2006. Measured at the 3-digit SITC level, *intra*-industry trade increased from 20 percent of world trade in 1962 to 44 percent of world trade in 2006. Based on this evidence, it would be appropriate to state that approximately one third of world trade is *intra*-industry trade.

Figure 4.1. The Evolution of Intra-Industry Trade at the 5- and 3-Digit SITC Levels (percent of total trade)



Source: Brühlhart (2009). Note: SITC refers to Standard International Trade Classification.

It is also clear that *intra*-industry trade is especially prominent in the trade in manufactured goods, especially as the degree of sophistication of the manufacturing process increases. Increased sophistication of the manufacturing process allows for both greater differentiation of final products in *horizontal intra*-industry trade and greater scope of fragmentation in *vertical intra*-industry trade.<sup>5</sup> For some countries and manufactured products, *intra*-industry trade can exceed 70 percent of trade.

*Intra*-industry trade was first analyzed in the context of trade among the countries of Western Europe, as well as trade between the United States and Europe. The early study by

<sup>5</sup> See OECD (2002).

Grubel and Lloyd (1975) focused on *intra*-industry trade among 10 original countries of the Organization for Economic Cooperation and Development (OECD), an organization consisting of mostly high-income countries. These 10 countries were: Australia, Belgium, Canada, France, Italy, Japan, the Netherlands, the United Kingdom, the United States, and West Germany (before integration with East Germany). These authors developed an index used to measure the degree of *intra*-industry trade that is explained in the appendix to this chapter. Using this index, they noted an increase in *intra*-industry trade among these 10 countries during the 1960s. Subsequent studies found that this trend continued into the 1970s and beyond.

It turns out, however, that it was a mistake to envision *intra*-industry trade as taking place exclusively among high-income countries. I mentioned in Chapter 1 that I spent the early years of the 1990s analyzing NAFTA for the US International Trade Commission. As part of this analysis, I developed a database of trade among the countries of North America for the year 1988.<sup>6</sup> What struck me at the time was the decidedly *intra*-industry character of the trade flows between Mexico and the United States even before NAFTA went into effect. With the few exceptions of petroleum, nonmetallic minerals, and non-electrical machinery, trade between these two countries was very balanced. I realized at that time that *intra*-industry trade could take place between low- and high-income countries as well as between high-income countries.

At about the same time, Globerman (1992) published results indicating substantial increases in *intra*-industry trade between the US and Mexico between 1980 and 1988. Ruffin (1999) analyzed trade between Mexico and the United States for 1998, a decade later than the year of my database and concluded that it was nearly 80 percent of bilateral trade. The OECD (2002) also noted Mexico's role in *intra*-industry trade, estimating it at over 70 percent of that country's trade during the 1996 to 2000 period. Clearly, *intra*-industry trade is not confined to developed countries alone.

Evidence of increases in *intra*-industry trade in Asia also surfaced. As indicated in the accompanying box, *intra*-industry trade in Asia appears to be most important among the newly industrialized countries (Singapore, Hong Kong, and South Korea) and the newly exporting countries (Malaysia, Thailand, the Philippines, and Indonesia). However, evidence emerged of increasing *intra*-industry trade between Japan and other Asian countries (e.g., Wakasugi, 1997), as well as in the trade of China and her major trading partners (e.g., Hu and Ma, 1999). Hence, we can view *intra*-industry trade as a multi-regional process that is increasing over time.<sup>7</sup> However, there are regions that have been left out of this trend. Evidence suggests that Western Asia (including the Middle East) and most of Africa participate very little in *intra*-industry trade.<sup>8</sup> This is one of the main distinctions between these two regions and the rest of the world with regard to international trade characteristics.

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<sup>6</sup> See Reinert, Roland-Holst, and Shiells (1993).

<sup>7</sup> We revisit the case of China in the appendix to this chapter.

<sup>8</sup> See, for example, Brühlhart (2009).

### **Intra-industry Trade in East Asia**

The phenomenon of *intra*-industry trade was first noticed in the expansion of trade among the countries of Western Europe and between Western Europe and the United States that occurred after World War II. Later, however, researchers recognized its importance for the countries of East Asia, including China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand. Early on, Hellvin (1994) provided estimates of *intra*-industry trade in East Asia that exceeded 20 percent in the mid-1980s. Subsequent analysis was provided by Thorpe and Zhang (2005) and Ando (2006). Thorpe and Zhang (2005) suggest that *intra*-industry trade increased from approximately 25 percent to approximately 50 percent between the mid-1970s and the mid 1990s. They also suggest that *vertical intra*-industry trade increased to about 30 percent during this period. Evidence from the machinery sector presented by Ando (2006) suggests that these trends continued through at least 2000.

The East Asian region remains a very important one for the world economy, setting trends that are later experienced in other regions. What can now be called decadal evidence on the expansion of East Asian trade suggests that *intra*-industry trade in general and *vertical intra*-industry trade in particular are going to be increasingly important for this region of the world economy.

Sources: Hellvin (1994), Thorpe and Zhang (2005) and Ando (2006).

The increasing extent of *intra*-industry trade in the world trading system has some important implications for the adjustment of economies to increasing trade. Recall from Chapters 2 and 3 that increases in *inter*-industry trade based on absolute or comparative advantage involve import sectors contracting and export sectors expanding. This, in turn, requires that productive resources, most notably workers, shift from contracting to expanding sectors in order to avoid unemployment. Workers in Vietnam must shift from the motorcycle sector to the rice sector. Workers in Japan must shift from the rice sector to the motorcycle sector. This is not always an easy process, and as we will discuss in Chapter 5, it often gives rise to calls for protection.

The adjustment process in the case of *intra*-industry trade can be quite different. A given sector experiences increases in imports and exports *simultaneously*. Therefore, workers are less likely to need to shift between sectors of their home economy. In the case of *horizontal intra*-industry trade, the labor market adjustment is across product market niches. For example, workers in the US cheese sector can adjust to the expansion of imports of cheese by expanding exports of a different cheese variety. In the case of *vertical intra*-industry trade, the labor market adjustment is across tasks or stages of production. For example, workers in a computer sector might need to shift from

producing both computer components and final, assembled computers to just producing certain components.<sup>9</sup>

The potential for *intra*-industry trade to provide smoother trade trajectories from an adjustment point of view has been dubbed the “smooth adjustment hypothesis” by Brülhart (2009). If we were to rank the *smoothness* of adjustment across the three types of trade, it would be as follows:

<i>Inter</i> -industry trade:	Low (not at all smooth)
<i>Vertical intra</i> -industry trade:	Medium (somewhat smooth)
<i>Horizontal intra</i> -industry trade:	High (smooth)

Engagement with the world trading economy is therefore easier from labor and political points of view in the case of *intra*-industry trade than in the case of *inter*-industry trade.

## An Explanation of Intra-Industry Trade

We are now going to develop an explanation of *horizontal intra*-industry trade using the example of US trade in cheese. As suggested above, in order to do this, we are going to have to allow for product differentiation among types of cheese. To keep things simple, we will restrict ourselves to two types of cheese: blue cheese (denoted by B) and food-service cheese (denoted by F). Since there are two distinct products, there are two distinct markets, each with its own price and quantity. This situation is represented in Figure 4.2.

Figure 4.2 depicts the two cheese markets from the perspective of the United States. There are two sets of axes, one for each type of cheese, with prices ( $P_B$  and  $P_F$ ) on the vertical axes and quantities ( $Q_B$  and  $Q_F$ ) on the horizontal axes. US households consume both types of cheese, and US firms produce both types of cheese. US demand curves for the two types of cheese are denoted  $D_B$  and  $D_F$ , and these are downward sloping. US supply curves for the two types of cheese are denoted  $S_B$  and  $S_F$ , and these are upward sloping. The US supply curve for food-service cheese is farther to the right than its supply curve for blue cheese. This reflects the presence of more firms producing food-service cheese than blue cheese.

The trade implications of these supply and demand relationships are illustrated in Figure 4.3. To simplify the situation for ourselves, we are going to assume that the United

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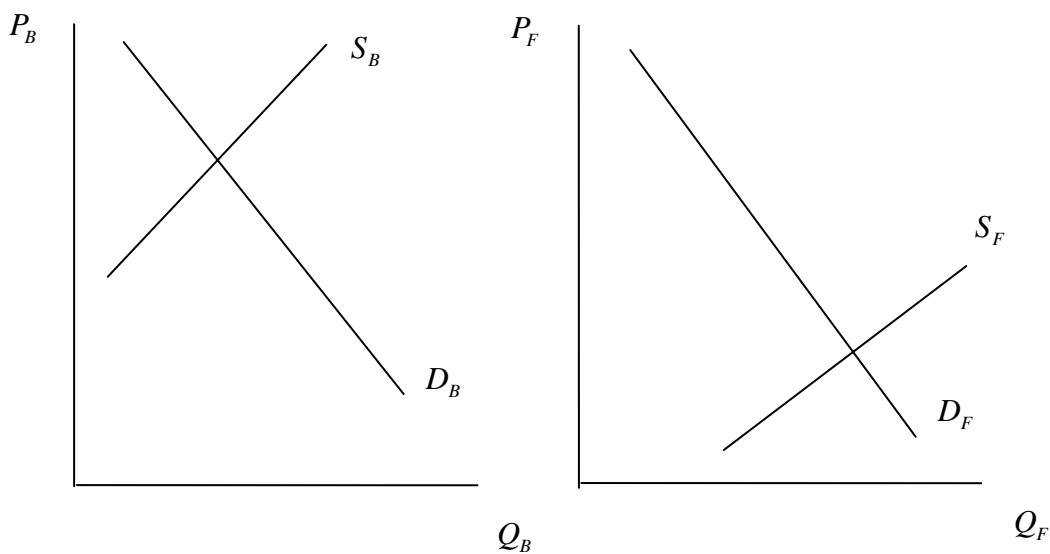
<sup>9</sup> Empirical evidence of *intra*-industry trade reducing demand for trade protection was first given in Marvel and Ray (1987). Subsequently, the same point was made by Grimwade (1989) and Thom and McDowell (1999). Ruffin (1999) also noted that: “One of the great benefits of intra-industry trade is that international trade need not cause the dislocations associated with inter-industry trade” (p. 7).

States cannot influence the world price of either type of cheese.<sup>10</sup> Thus, in Figure 4.3, the United States cannot affect the values of either  $P_B^W$  or  $P_F^W$  along the vertical axes. Therefore, even with quality differences implying that the world price of food-service cheese is below the world price of blue cheese ( $P_F^W < P_B^W$ ), the United States exports  $E_F$  of food-service cheese and imports  $Z_B$  of blue cheese. In this way, the United States engages in *intra*-industry trade in cheese, *both* importing *and* exporting cheese. An alternative example of *vertical intra*-industry trade in computer products is provided in the accompanying box.

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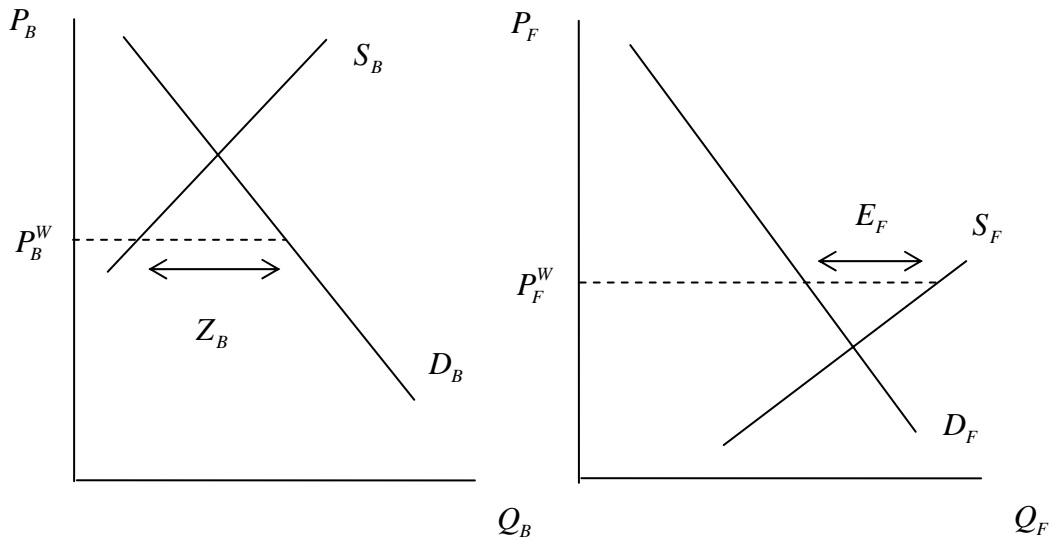
Figure 4.2. Markets for Blue and Food-service Cheese

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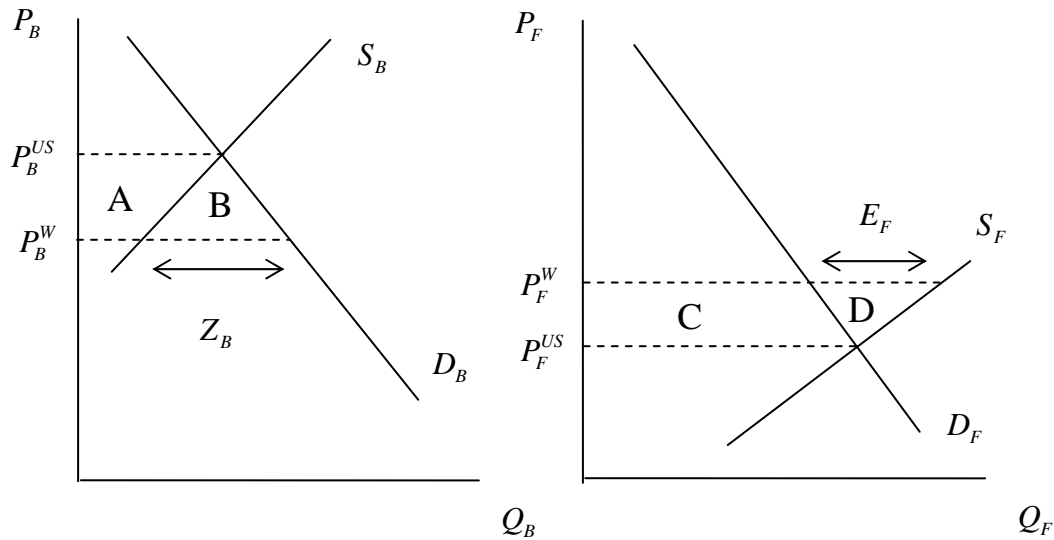

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<sup>10</sup> This comprises what international economists call the “small country assumption.” For the case of the United States in world cheese markets, this might not always be a good assumption. We use it here, however, to simplify our analysis of *intra*-industry trade.

Figure 4.3. US *Intra-Industry Trade* in Cheese

Does *intra*-industry trade in cheese benefit the United States? We take up this issue in Figure 4.4. This figure is the same as Figure 4.3, but it includes autarky prices for the United States ( $P_B^{US}$  and  $P_F^{US}$ ). Take first the blue cheese market. You can see that, as the United States moves from autarky to trade, the gain in US consumer surplus (A + B) exceeds the loss in US producer surplus (A) by area B.<sup>11</sup> Next take the food-service cheese market. You can see that, as the United States moves from autarky to trade, the gain in US producer surplus (C + D) exceeds the loss in US consumer surplus (C) by area D. Therefore, the movement from autarky to *intra*-industry trade entails a total gain of areas B and D. There are gains from *intra*-industry trade as well as from *inter*-industry trade.

<sup>11</sup> Recall that there is an appendix to Chapter 2 reviewing the consumer surplus and producer surplus ideas. Please refer to it if you need to refresh your memory.

Figure 4.4. The Gains from *Intra-Industry Trade*

### Computer Products Trade

As noted by Curry and Kenney (2004), the personal computer is a highly modular product. This fact has ensured that personal computer assembly is one that supports *vertical intra-industry trade* via fragmentation and production sharing. The tasks involved in building a personal computer stretch out along what is known as the **value chain**, ranging from raw materials to many kinds of component manufacturing to final assembly and sales. Various raw materials such as ceramics, metals and chemicals are used to produce a large range of components such as the microprocessor, circuit boards, display panel and many others. Compared to component manufacturing, assembly is very straightforward. Indeed, Curry and Kenney (2004) state that: “Modularity and international standardization has proceeded to such an extent that an assembler with minimal training can assemble a PC in fifteen minutes with little more equipment than a screwdriver and a socket set” (p. 118). Consequently, computer assembly is more of a logistics operation than a manufacturing operation.

In recent years, a great deal of computer assembly has been taken on by Taiwanese firms operating in China. These firms often need to import computer components (particularly the high end components such as microprocessors) that are then used to assemble the final computer. Despite a growing PC market in China, most of the assembled computers are then exported to major markets outside of China. Thus, China imports computer products at one stage of processing (components) and exports

computer products at another stage of processing (the final, assembled computer). This is *vertical intra-industry* trade in computer products.

Sources: Curry and Kenney (2004) and McIvor (2005)

## Conclusion

In Chapters 2 and 3, we considered models of *inter-industry* trade. However, approximately one third of world trade consists of *intra-industry* trade. This breaks down into two types: *horizontal intra-industry* trade based on product differentiation, and *vertical intra-industry* trade based on fragmentation and potentially on comparative advantage. If, as you proceed through this book, you have trouble distinguishing *inter-industry* and *intra-industry* trade, be sure to refer back to Table 4.1. We also noted that adjustment to trade can be smoother in the case of *intra-industry* trade than in the case of *inter-industry* trade.

We have used the supply and demand diagram to develop a simple analysis of *horizontal intra-industry* trade. Our description of vertical intra-industry trade made preliminary use of the **value chain** and the notion of *tasks* in a preliminary description of international production. We will return to these ideas more fully in Part II of the book.

## Review Exercises

1. In your own words, please explain the difference between *inter-industry* and *intra-industry* trade.
2. How is the phenomenon of horizontal *intra-industry* trade related to product diversification?
3. Create your own example of a *horizontal intra-industry* trade model by choosing a country and a product. Draw a diagram equivalent to Figure 4.3 describing *intra-industry* trade for your example. Next, draw a diagram equivalent to Figure 4.4 describing the gains from *intra-industry* trade.
4. Create your own example of vertical intra-industry trade and explain how it is related to fragmentation.
5. Explain why the adjustment process stemming from *intra-industry* trade is easier for a country to accommodate than the adjustment process stemming from *inter-industry* trade.

## Further Reading and Web Resources

The original work on intra-industry trade was by Grubel and Lloyd (1975), and an early review was by Greenaway and Torstensson (1997). For concise, more recent reviews, see Chapter 10 of van Marrewijk (2002), OECD (2002) and van Marrewijk (2009). For a longer, empirical review, see Brühlhart (2009).

## References

Ando, M. (2006) "Fragmentation and Vertical Intra-Industry Trade in East Asia," *North American Journal of Economics and Finance*, 17:3, 257-281.

Arndt, S.W. (2009) "Fragmentation," in K.A. Reinert, R.S. Rajan, A.J. Glass and L.S. Davis (eds.), *The Princeton Encyclopedia of the World Economy*, Princeton University Press, 498-502.

Bergstrand, J.H. (1982) "The Scope, Growth, and Causes of Intra-Industry International Trade," *New England Economic Review*, September-October 1982, 45-61.

Brühlhart, M. (2009) "An Account of Global Intra-industry Trade, 1962-2006," *World Economy*, 32:3, 2009.

Curry, J. and M. Kenney (2004) "The Organization and Geographic Configuration of the Personal Computer Value Chain," in M. Kenney (ed.), *Locating Global Advantage: Industry Dynamics in the International Economy*, Stanford University Press, 113-141.

Globerman, S. (1992) "North American Trade Liberalization and Intra-industry Trade," *Weltwirtschaftliches Archiv*, 128:3, 487-497.

Greenaway, D. and J. Torstensson (1997) "Back to the Future: Taking Stock on Intra-industry Trade," *Weltwirtschaftliches Archiv*, 133:2, 249-269.

Grimwade, N. (1989) *International Trade: New Patterns of Trade, Production, and Investment*, Routledge, London.

Grubel, H.G. and P.J. Loyd (1975) *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products*, John Wiley, New York.

Hellvin, L. (1994) "Intra-Industry Trade in Asia," *International Economic Journal*, 8:4, 27-40.

Hu, X. and Y. Ma (1999) "International Intra-industry Trade of China," *Weltwirtschaftliches Archiv*, 135:1, 82-101.

Marvel, H.P. and E.J. Ray (1987) “Intraindustry Trade: Sources and Effects on Production,” *Journal of Political Economy*, 95:6, 1278-1291.

McIvor, R. (2005) *The Outsourcing Process: Strategies for Evaluation and Management*, Cambridge University Press.

Organization for Economic Cooperation and Development (2002) “Intraindustry and Intrafirm Trade and the Internationalisation of Production,” *OECD Economic Outlook*, 71:1, 159-170.

Reinert, K.A., D.W. Roland-Holst, and C.R. Shiells (1993) “Social Accounts and the Structure of the North American Economy,” *Economic Systems Research*, 5:3, 295-326.

Ruffin, R.J. (1999) “The Nature and Significance of Intra-Industry Trade,” *Federal Reserve Bank of Dallas Economic and Financial Review*, 4<sup>th</sup> Quarter, 2-9.

Thom, R. and M. McDowell (1999) “Measuring Marginal Intra-Industry Trade,” *Weltwirtschaftliches Archiv*, 135:1, 48-61.

Thorpe, M. and Z. Zhang (2005) “Study of the Measurement and Determinants of Intra-Industry Trade in East Asia,” *Asian Economic Journal*, 19:2, 231-247.

Van Marrewijk, C. (2002) *International Trade and the World Economy*, Oxford University Press, Oxford.

Van Marrewijk, C. (2009) “Intraindustry Trade,” in K.A. Reinert, R.S. Rajan, A.J. Glass and L.S. Davis (eds.), *The Princeton Encyclopedia of the World Economy*, Princeton University Press, 708-712.

Wakasugi, R. (1997) “Missing Factors of Intra-Industry Trade: Some Empirical Evidence Based on Japan,” *Japan and the World Economy*, 9:3, 353-362.

## **Appendix: The Grubel-Lloyd Index**

We mentioned in this chapter that Grubel and Lloyd (1975) completed the first important study of *intra*-industry trade. In this study, these authors developed what is now a well-known index for measuring the degree of *intra*-industry trade. This measure is now called the **Grubel-Lloyd index**. This appendix introduces you to this index and provides a brief example of its application to China.

The Grubel-Lloyd index looks at a given product category denoted by the letter *i*. The index of *intra*-industry trade in this product category is usually denoted by  $B_i$ .  $B_i$  is calculated based on the level of imports of product *i* (denoted  $Z_i$ ) and the level of exports of product *i* (denoted  $E_i$ ). The Grubel-Lloyd index is calculated as:

$$B_i = \left[ 1 - \frac{|E_i - Z_i|}{(E_i + Z_i)} \right] \cdot 100$$

Recall that  $|E_i - Z_i|$  refers to the *absolute value* of the difference between exports and imports of product  $i$ . This value is always positive. The best way to make sense of the Grubal-Lloyd index is to consider the case where *intra*-industry trade is at its maximum. That is where exports and imports of product  $i$  are exactly equal to one another. In this case,  $|E_i - Z_i| = 0$  and  $B_i = (1 - 0) \cdot 100 = 100$ . Therefore, the Grubal-Lloyd index ranges from 0 to 100. As the index increases from 0 to 100, the amount of *intra*-industry trade in product category  $i$  increases.

We can visualize this using Figure 4.5. In cases where  $E_i = Z_i$ , a particular trading economy will be on the 45 degree line in this figure and  $B_i = 100$ . As the trading economy diverges in either direction from the 45 degree line,  $B_i$  will decline from 100. If the import and export values are such that one is zero (the pure *inter*-industry trade case), then the economy will be one of the two axes and  $B_i = 0$ .

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Figure 4.5. Visualizing the Grubel-Lloyd Index

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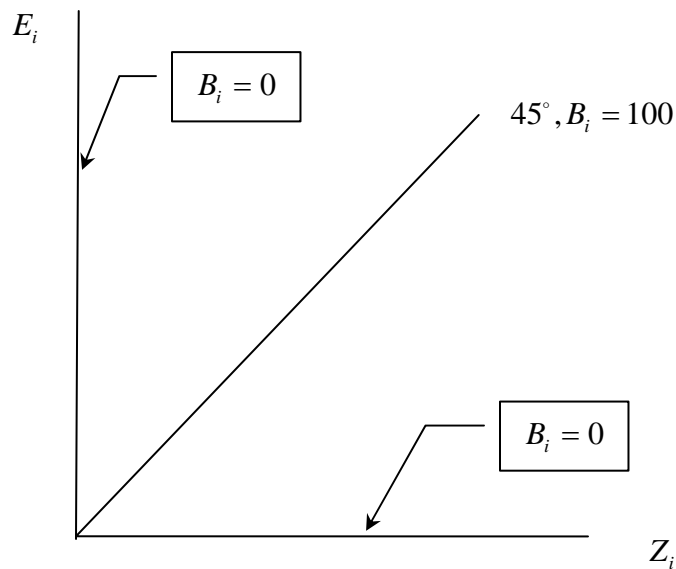


Table 4.2 reports a few measures of *intra*-industry trade for China calculated by Van Marrewijk (2009). Van Marrewijk rightly draws three conclusions from the results presented in this table. First, as we disaggregate further (moving right to left in the table), the amount of trade classified as *intra*-industry declines. Second, despite this decline, *intra*-industry trade does not disappear.<sup>12</sup> Third, as discussed in this chapter, the amount of *intra*-industry trade increases over time.

Table 4.2. Measuring China's *Intra*-Industry Trade using the Grubel-Lloyd Index

Year	3-digit SITC or 237 Sectors	2-digit SITC or 67 Sectors	1-digit SITC or 10 Sectors
1980	20	30	63
1985	20	29	44
1990	36	45	60
1995	38	48	67
2000	39	48	57
2005	42	49	58

Source: Van Marrewijk (2009). Note: SITC refers to standard international trade classification. The Grubel-Lloyd indices reported here are average, trade-weighted indices.

<sup>12</sup> Van Marrewijk (2009) notes that “This is a general characteristic of current trade flows as intraindustry trade exists for very detailed sector classifications” (p. 710). For examples of the detailed sector classifications for the case of China, see Hu and Ma (1999).