

## 19. Transfer Prices

### A. The Transfer Price Problem

#### A.1 What is a Transfer Price?

**19.1** When there is a international transaction between say two divisions of a multinational enterprise that has establishments in two or more countries, then the value of the transaction to the exporting division will be equal to the value of the transaction for the importing division. Thus when the multinational enterprise works out its profits worldwide for the quarter when the transaction took place, the export value will equal the import value and hence will cancel out, leaving the company's overall profits unchanged, no matter what price it chooses to value the transaction.<sup>1</sup> The price chosen to value the transaction is called a *transfer price*. Hence, at first glance, it appears that the multinational firm could choose the transfer price for the transaction to be practically anything. However, in a world where there are taxes on international transactions and where the rates of business income taxation differ across countries, then as will be seen below, the situation is actually worse: in this situation, the multinational will have definite financial incentives to *choose strategically* the transfer price to minimize the amount of taxation paid to both jurisdictions. It is this element of strategic choice that casts doubt on the usefulness of simply collecting transfer prices just as if they were ordinary prices between unrelated parties.

**19.2** This chapter is devoted to an exposition of alternative transfer pricing concepts to suit different purposes and advice to statistical agencies on possible methods for collecting the type of transfer price to suit their primary purpose.<sup>2</sup> In the remainder of section A, some background information detailing the importance and complexity of pricing intra-firm trade will be presented and then a brief outline of the remainder of the chapter will be presented.

#### A.2 The Prevalence of Transfer Pricing in International Trade

**19.3** The widespread use of transfer pricing is illustrated by the U.S. experience. In calendar 2000, the latest year that the data are available, the Bureau of Economic Analysis reported that \$241 billion (or 31 percent) of export goods and \$452 billion (or 37 percent) of imports were between related parties. During the past 20 years these percentages have tended to fluctuate somewhat. The value for exports has ranged between 31 and 40 percent, while the comparable range for imports is between 37 and 44 percent. Regardless of the actual percentage, intra-firm shipments continue to represent a substantial portion of U.S. trade.

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<sup>1</sup> This assertion requires the proviso that there are no trade taxes on the transaction and that business income tax rates are equal in both countries.

<sup>2</sup> The material in this chapter is largely based on Diewert, Alterman and Eden (2005) and Eden (1998).

**19.4** It should be noted that the characteristics of intra-firm trade could be different from trade between unrelated parties. For example, in the U.S. in 2001, only 13 percent of exports to both China and Korea were intra-firm, while 41 percent of sales to Mexico were between related parties. On the import side, fully 74 percent of U.S. imports from Japan were related party trade, while the comparable figure for China was just 18 percent. Similar differences crop up when looking at the data by industry, with especially high proportions of intra-firm trade in transportation equipment, computers and chemicals.<sup>3</sup> Even within intra-firm trade, there can be significant differences. For U.S. multinationals, 65 percent of their exports in 1999 consisted of intermediate products exported to overseas affiliates for further processing or assembly. In contrast, for foreign multinationals, 76 percent of their shipments to the U.S. in 1998 were finished goods ready for final sale.<sup>4</sup> Given these types of variations, simply excluding intra-firm trade when constructing export and import price indexes would not be appropriate.

**19.5** Who decides if the transfer prices chosen by multinational firms are appropriate? In the U.S., there are two relevant authorities: The Internal Revenue Service (IRS) and the U.S. Customs Service. While U.S. (and most foreign) regulations call for the use of an *arm's length standard* in valuing intra-firm trade, these two agencies historically have worked independently in deriving values for intra-firm trade, in part because they have differing objectives.<sup>5</sup> Tariff officials, who are attempting to maximize duty assessments, will tend to want to raise the value of imported goods, while the IRS will have a tendency to want to lower the value of imports in order to maximize the amount of domestic profits.<sup>6</sup> The reason for these differing points of view will be further discussed below. Furthermore, while Customs values tend to be finalized comparatively quickly, final valuations associate with IRS audits and subsequent court procedures can drag on for years.<sup>7</sup> The laws, procedures and documentation covering transfer prices are complicated and substantial. Both agencies devote significant resources to pricing intra-firm trade. This brief summary of the US situation, of course, does not address the transfer price regulations associated with other countries but typically, they are just as complex.

**19.6** Because of the complexity of transfer price regulations, corporations can end up devoting substantial resources to valuing intra-firm trade. In a recent survey by an accounting firm, fifty-nine percent of multinationals indicated that they had undergone an

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<sup>3</sup> These data are from the Bureau of the Census (2002). Although the Census data is not considered as accurate as data from BEA, the aggregate numbers are fairly consistent.

<sup>4</sup> See Zeile (1997). In addition, more recent data is available directly from BEA.

<sup>5</sup> Under an Arm's Length Standard, the transfer price should equal the price that would be settled on if the two trading firms were unrelated. This will be discussed in more detail below.

<sup>6</sup> See Eden (1998; 395-96) for further details.

<sup>7</sup> See Eden (1998; 684) for mention of 4 cases that each dragged on for over a decade.

audit of their transfer pricing practices in 2001.<sup>8</sup> Increasingly multinational traders avail themselves of any number of accounting firms that specialize in assisting corporations in navigating the multitude of both domestic and foreign regulations associated with pricing intra-firm trade. Thus the transfer price problem is not only a problem for price statisticians, but it is also a problem for multinationals engaged in international trade.

### **A.3 An Overview of the Chapter**

**19.7** In the early sections of the chapter, some of the theoretical concepts for various types of transfer prices will be presented. Then in the later sections of the chapter, “practical” methods for estimating transfer prices will be discussed. The economic approach is the same economic approach that was used in Alterman, Diewert and Feenstra (1999), which developed a PPI oriented approach to the import price index (part of the intermediate input PPI conceptually) and the export price (part of the gross output PPI conceptually). This approach is consistent with the “resident’s perspective” adopted in Chapter 18, though the theory of transfer pricing remains the same for the “non-resident’s perspective.”

**19.8** In section B, the four main types of transfer price that have been considered in the theoretical literature on transfer prices are defined in general terms. In the following two sections, the transfer price problem is studied in more detail in the context of two affiliated establishments in two countries trading a single commodity. While this framework is very simple, it suffices to illustrate the various theoretical constructs for transfer prices that have been suggested in the academic literature.

**19.9** In section C.1, the simplest case is studied where there are no trade taxes, business income taxes do not exist (or are the same in the two jurisdictions) and there is an external market price for the traded commodity. In section C.2, the case is considered where there are no trade or business income tax distortions but an external market for the internationally traded commodity does not exist.

**19.10** In section D, the analysis is extended to the case where the rates of business income taxation differ in the two countries (section D.1) and to the case where the rate of business taxation are the same but there are trade taxes (section D.2). Although the modeling framework is rather simple, most of the complexities of transfer pricing can be illustrated using it.

**19.11** Section E looks at the main questions that are of interest to price statisticians: namely, what are the *practical alternatives* for collecting transfer prices and can they be ordered in terms of their desirability?

**19.12** Section F concludes.

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<sup>8</sup> The survey indicated that the rate for was even higher when looking at just U.S. trade; see Ernst and Young (2001).

## B. Alternative Transfer Pricing Concepts

**19.13** There are four main theoretical concepts for a transfer price. These concepts are:

- the *external market* or *arm's length* transfer price<sup>9</sup>;
- the *efficient* transfer price;
- the *profit maximizing* transfer price and
- the *economic* transfer price that is suitable for collection by a statistical agency.

**19.14** The first concept for a transfer price is feasible if there is a well-defined *external market price* for the traded commodity where units can be bought or sold at a common price (let us call it 'w'). Then the transfer price for the commodity is just this price w. This is the *arm's length transfer price*.

**19.15** The second concept for a transfer price arises if there is no external market for the commodity that is traded between two production units (or establishments) of a multinational that are located in different countries. The *efficient transfer price* is generated by solving a joint profit maximization problem involving the two establishments and it is a Lagrange multiplier, or shadow price, which corresponds to the constraint that says the output of the producing establishment must equal the input of the purchasing establishment. If there are no tax distortions<sup>10</sup>, then this transfer price can also be generated by setting up two profit maximization problems for the two establishments involving the traded commodity being sold by one unit at the price w say and being purchased by the other production unit at the price w. This artificial price is then varied so that the supply of the one establishment equals the demand of the other establishment and the resulting transfer price is called the *optimal decentralized transfer price*.<sup>11</sup> If there are no tax distortions and the establishments take all

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<sup>9</sup> This price corresponds to Eden's (1998; 37) (2001; 32) *Comparable Uncontrolled Price* concept for a transfer price. Eden (2001; 32) follows U.S. Internal Revenue Service conventions and further distinguishes an *external CUP* (also referred to as an *external comparable*) as the price set between two unrelated parties for the same or similar product sold under the same or similar circumstances) and an *internal CUP* (also referred to as an *internal or in-house comparable*) where the multinational enterprise simultaneously buys or sells the same or similar product with an unrelated party. The IRS recommends internal comparables as preferable to external comparables for income tax purposes; see Feinschreiber (2004; 4). This concept for a transfer price also roughly corresponds to the U. S. Customs Service *transactions value* concept for a transfer price; see Eden (2001; 35-36).

<sup>10</sup> We also need to rule out increasing returns to scale in both establishments in order to get the existence of the decentralized transfer price.

<sup>11</sup> This concept of a transfer price is also called an *arm's length transfer price* by Hirshleifer (1956); see also Diewert (1985; 61). Under the no tax distortions assumption and a no increasing returns to scale assumption for each establishment, this second concept for a transfer price is equal to Diewert's (1985; 49-66) efficient, arm's length and decentralized transfer price concepts. Note that the external market transfer price is also efficient

(continued)

other input and output prices as fixed, this transfer price will also be a socially efficient one.

**19.16** The *profit maximizing transfer price* is the third main concept for a transfer price. With no taxes on trade and no taxation of business income in the two jurisdictions, the profit maximizing transfer price<sup>12</sup> is the same as the efficient transfer price. But with tax distortions in either of the two jurisdictions, then the profit maximizing transfer price will generally be different from the efficient transfer price. In fact, with tax distortions and no constraints on the behavior of the multinational, the profit maximizing transfer price will usually be zero or an arbitrarily large number. However, usually, the tax authorities will not allow such extreme transfer prices and they will either impose a transfer price or the multinational will choose a strategic transfer price that the tax authorities will accept.

**19.17** The *economic transfer price* that is suitable, in theory, for collection by a statistical agency will in all cases be a marginal cost (for the exporting establishment) or a marginal revenue (for the importing establishment). In the case of no tax distortions, the economic transfer price will coincide with the external market transfer price or the efficient transfer price.

**19.18** In sections C and D below, it is shown how these concepts for a transfer price can be defined for the case where there are only *two* establishments of a multinational trading in a *single* commodity. This very simple framework will suffice to illuminate the problems involved in constructing transfer prices.

## **C. Transfer Price Concepts when There are no Trade or Income Taxes**

### **C.1 Transfer Pricing when an External Market Exists**

**19.19** Transfer pricing when there is a well defined external market for the traded commodity and no tax distortions in the two countries where the two establishments of the multinational are located is very simple. Assume that establishment 1 in country 1 imports the commodity from establishment 2 in country 2. Let  $x^1 \geq 0$  denote the total quantity of the commodity used by establishment 1 and let  $x^2 \geq 0$  denote the production of the commodity by establishment 2. In this section, it is assumed that there are no tax distortions in order to simplify the analysis.

**19.20** Suppose that establishment 1 has a technology set  $S^1$  which is defined to be a set of

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and in fact, multinational profits will always be greater (or at least not less than) in the situation where an external market for the product exists than the situation where no such market exists.

<sup>12</sup> The profit maximizing transfer price is indeterminate under these conditions; it could be any positive price since it cancels out of the objective function of the multinational's global profit maximization problem.

feasible net output vectors<sup>13</sup>,  $y^1$ , that can be produced if the amount  $x^1$  of the imported commodity is available. Suppose further that the establishment faces the positive vector of prices  $p^1$  for these net outputs. Then the *net revenue function* of establishment 1,  $r^1$ , can be defined as follows<sup>14</sup>:

$$(19.1) \quad r^1(p^1, x^1) \equiv \max_y \{p^1 \cdot y : (y, x^1) \text{ belongs to } S^1\}$$

where  $p^1 \cdot y \equiv \sum_{i=1}^1 p_i^1 y_i$  is the inner product between the vectors  $p^1$  and  $y$ . Thus  $r^1(p^1, x^1)$  is the net revenue establishment 1 can achieve if it faces the price vector  $p^1$  for its outputs and non  $x$  inputs and it has available for use  $x^1$  units of the imported commodity.

**19.21** Suppose now that establishment 2 has a technology set  $S^2$  which is defined to be a set of feasible net input vectors<sup>15</sup>,  $z^2$ , that can be used to produce the amount  $x^2$  of the commodity that is exported to establishment 1 or which is sold on the general market. Suppose further that this establishment faces the positive vector of prices  $p^2$  for these net inputs. Then the *net cost function* for establishment 2,  $c^2$ , can be defined as follows<sup>16</sup>:

$$(19.2) \quad c^2(p^2, x^2) \equiv \min_z \{p^2 \cdot z : (z, x^2) \text{ belongs to } S^2\}.$$

Thus  $c^2(p^2, x^2)$  is the minimum net cost establishment 2 can achieve if it faces the price vector  $p^2$  for its net inputs and it is asked to produce  $x^2$  units of the commodity which can be exported to establishment 1 or sold on the general market.

**19.22** Given that the multinational faces the price  $w > 0$  for the  $x$  commodity, the multinational's *joint profit maximization problem* is:<sup>17</sup>

$$(19.3) \quad \max_{x^1, x^2} \{r^1(p^1, x^1) - c^2(p^2, x^2) - w[x^1 - x^2]\}.$$

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<sup>13</sup> If the  $i$ th component of  $y^1$  is positive, then the  $i$ th commodity is an output produced by the establishment while if the  $i$ th component of  $y^1$  is negative, then the  $i$ th commodity is an input used by the establishment.

<sup>14</sup> See Diewert (1974; 133-146) (1993; 165-169) for the properties of net revenue or profit functions. It should be noted that definition (2) assumes competitive behavior on the part of the firm in the  $y$  markets. However, this assumption is not essential for our analysis. The firm could be behaving in a monopolistic or monopsonistic manner in these other markets but the revenue function as a function of the amount of imported commodity  $x$  can still be defined; see Diewert (1993; 169-174) for alternative methods for defining the revenue function in this case. Diewert, Alterman and Eden (2005) consider transfer pricing problems in the monopolistic context.

<sup>15</sup> If the  $i$ th component of  $z^2$  is positive, then the  $i$ th commodity is an input used by the establishment while if the  $i$ th component of  $z^2$  is negative, then the  $i$ th commodity is an output produced by the establishment.

<sup>16</sup> See Diewert (1993; 167) for the properties of net cost or joint cost functions.

<sup>17</sup> The prices in country 2 must be converted into the prices of country 1 using prevailing exchange rates (or vice versa). Henceforth, it is assumed that all prices are expressed in a common currency.

**19.23** If  $r^1$  and  $c^2$  are differentiable with respect to their  $x$  arguments, then the first order necessary conditions for  $x^{1*}$  and  $x^{2*}$  to solve (19.3) are:

$$(19.4) \quad \partial r^1(p^1, x^{1*}) / \partial x = w ;$$

$$(19.5) \quad \partial c^2(p^2, x^{2*}) / \partial x = w.$$

Equation (19.4) says that at an optimal allocation of resources between the two establishments, the *marginal revenue* generated by the last unit of  $x$  that is used by establishment 1 should be equal to the external market price of the  $x$  commodity, which is  $w$ . Equation (19.5) says that at an optimal allocation of resources between the two establishments, the *marginal cost* of establishment 2 for producing the last unit of  $x$  should be equal to the external market price of the  $x$  commodity, which is again  $w$ .

**19.24** The second order sufficient conditions for  $x^{1*}$  and  $x^{2*}$  to solve (19.3)<sup>18</sup> are conditions (19.4) and (19.5) and the following conditions:

$$(19.6) \quad \partial^2 r^1(p^1, x^{1*}) / \partial x^2 < 0 ;$$

$$(19.7) \quad \partial^2 c^2(p^2, x^{2*}) / \partial x^2 > 0.$$

Condition (19.6) says that marginal revenue is falling and condition (19.7) says that marginal cost is increasing. Basically, these two conditions rule out increasing returns to scale in both establishments in a neighborhood of the optimal allocation.

**19.25** If  $x^{2*} > x^{1*}$ , then the multinational sells  $x^{2*} - x^{1*}$  units of the internationally traded commodity to the external market while if  $x^{2*} < x^{1*}$ , then the multinational purchases  $x^{1*} - x^{2*}$  units of the internationally traded commodity from the external market.

**19.26** The external market case is relatively easy to deal with empirically: the *external market price*  $w$  is the appropriate transfer price for statistical agencies to use to value the transactions between the two production units of the multinational.<sup>19</sup>

**19.27** In section C.2, the more difficult case is considered where no external market for the traded commodity exists. This case is fairly common.

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<sup>18</sup> Actually, conditions (6) and (7) only guarantee that  $x^{1*}$  and  $x^{2*}$  locally maximize (3) but if conditions (6) and (7) hold for all  $x^1 > 0$  and  $x^2 > 0$ , then  $x^{1*}$  and  $x^{2*}$  will be a global maximum for (3).

<sup>19</sup> This is what is called a Comparable Uncontrolled Transfer Price (CUP) in the business literature on transfer pricing. "The CUP method looks for a comparable product to the transaction in question, either in terms of the same product being bought or sold by the MNE in a comparable transaction with an unrelated party, or the same or similar product being traded between two unrelated parties under the same of similar circumstances." (Eden 1998; 37). Obviously, the same concept is applicable in a tax distorted context as well.

## C.2 Transfer Pricing with no External Market and no Trade or Profit Taxes

**19.28** If no external market for the internationally traded commodity exists, then the amount demanded by establishment 1,  $x^1$ , must equal the amount supplied by establishment 2,  $x^2$ . Thus replacing  $x^1$  and  $x^2$  in (19.3) by a common  $x$  leads to the following (efficient) *global multinational profit maximization problem*:

$$(19.8) \max_x \{r^1(p^1, x) - c^2(p^2, x)\}.$$

**19.29** The first order necessary condition for  $x^{**}$  to solve (19.8) is:

$$(19.9) \partial r^1(p^1, x^{**})/\partial x = \partial c^2(p^2, x^{**})/\partial x \equiv w^{**}$$

The first equation in (19.9) says that at an optimal allocation of resources between the two establishments, the *marginal revenue* generated by the last unit of  $x$  that is used by establishment 1 should be equal to the *marginal cost* of establishment 2 for producing the last unit of  $x$ . The second equation in (19.9) defines this common marginal cost and marginal revenue as  $w^{**}$ . Note that the allocation of resources generated by the solution to problem (19.8) will not in general be equal to the solution to problem (19.3) unless the solution to (19.3) had the property that  $x^{1*} = x^{2*}$ , so that there were no external sales or purchases of  $x$  at this solution to (19.3).

**19.30** The second order sufficient conditions for  $x^{**}$  to solve (19.8) are conditions (19.9) and the following condition:

$$(19.10) \partial^2 r^1(p^1, x^{**})/\partial x^2 - \partial^2 c^2(p^2, x^{**})/\partial x^2 > 0.$$

Condition (19.10) is actually weaker than the earlier second order conditions (19.6) and (19.7): the new condition is consistent with increasing returns to scale in one of the two establishments.

**19.31** In order to obtain an interpretation for the transfer price  $w^{**}$  defined by (19.9), consider the following constrained maximization problem, which is equivalent to (19.8):

$$(19.11) \max_{x^1, x^2} \{r^1(p^1, x^1) - c^2(p^2, x^2) : x^1 - x^2 = 0\}.$$

It turns out that  $w^{**}$  is the optimal Lagrange multiplier for the constraint in (19.11). Hence following Diewert (1985; 51), Samuelson's (1947; 132) standard interpretation for a Lagrange multiplier may be used and the efficient transfer price  $w^{**}$  may be interpreted as the marginal increase in the worldwide net output of the multinational firm (valued at the reference prices  $p^1$  and  $p^2$ ) due to an exogenous gift to the multinational of a marginal unit of the intermediate input. Note that Copithorne (1976; 346) used the term *opportunity cost transfer price* in place of the present term, *efficient transfer price*.

**19.32** If the earlier second order conditions (19.6) and (19.7) are satisfied globally, then it

can be shown that the efficient allocation of resources, i.e., the  $x^{**}$  solution to (19.8), can be *decentralized* if the  $w^{**}$  defined by (19.9) is used as a transfer price. To see this, consider the following profit maximization problems for establishments 1 and 2 using the transfer price  $w^{**}$ :

$$(19.12) \max_x \{r^1(p^1, x) - w^{**}x\};$$

$$(19.13) \max_x \{w^{**}x - c^2(p^2, x)\}.$$

It can be seen that the first order necessary conditions for (19.12) and (19.13) are:

$$(19.14) \partial r^1(p^1, x^{**})/\partial x - w^{**} = 0;$$

$$(19.15) w^{**} - \partial c^2(p^2, x^{**})/\partial x = 0.$$

It can be seen that (19.14) and (19.15) are equivalent to the conditions (19.9), which are the first order conditions for  $x^{**}$  to solve (19.8). The second order sufficient conditions for (19.12) and (19.13) are:

$$(19.16) \partial^2 r^1(p^1, x^{**})/\partial x^2 < 0;$$

$$(19.17) -\partial^2 c^2(p^2, x^{**})/\partial x^2 < 0$$

and these conditions will hold if the earlier second order conditions (19.6) and (19.7) hold globally. Thus under stronger conditions on the technology of establishments 1 and 2 i.e., no increasing returns to scale in either establishment), the above argument shows that the efficient transfer price is also the *decentralized arm's length transfer price* introduced by Hirshleifer (1956) that equates the supply of establishment 2 to the demand of establishment 1.

**19.33** To sum up, the efficient transfer price  $w^{**}$  was defined as the solution to equation (19.9); i.e., it was necessary to find an  $x^{**}$  such that marginal revenue in establishment 1 is equal to marginal cost in establishment 2, so that  $\partial r^1(p^1, x^{**})/\partial x = \partial c^2(p^2, x^{**})/\partial x$ , and then this common value is the appropriate transfer price  $w^{**}$ . This efficient transfer price is an appropriate price for a statistical agency to collect for the traded commodity if it can be identified. From the viewpoint of production theory, the efficient transfer price will have the same standing as the observable external prices  $p^1$  of the establishment in country 1 or the observable external prices  $p^2$  of the establishment in country 2.

**19.34** In the following section, the assumption that there is no external market transfer price available is continued as was made in this subsection.

## **D. Transfer Pricing when There are Trade or Profits Taxes and No External Market**

### **D.1 Transfer Pricing with Profit Taxes**

**19.35** Consider the multinational's profit maximization problem in the case where there is no external market for the commodity (as in the previous subsection) and there are no trade taxes but there are *differential rates of business income taxation* in the two jurisdictions. Let the rate of business income taxation in country 1 be  $T_1$  and in country 2 be  $T_2$  where the numbers  $T_i$  are fractions between 0 and 1. If the multinational chooses the transfer price  $w > 0$ , then the multinational's global profit maximization problem is now:

$$(19.18) \max_{x,w} (1-T_1)\{r^1(p^1,x) - wx\} + (1-T_2)\{wx - c^2(p^2,x)\} \\ = \max_{x,w} (1-T_1)r^1(p^1,x) - (1-T_2)c^2(p^2,x) + (T_1-T_2)wx$$

**19.36** Comparing (19.18) with the profit maximization problem (19.8) in the previous section, it can be seen that there are two differences:

- The differential rates of business income taxation,  $T_1$  and  $T_2$ , lead to a difference between the terms  $(1-T_1)wx$  and  $(1-T_2)wx$  and so the terms involving the transfer price  $w$  no longer cancel out as they did in (19.8) and
- The multinational now is now able to choose the transfer price  $w$  as well as the level of international trade in the intermediate input  $x$ ; i.e., instead of just maximizing with respect to  $x$ , the firm now maximizes with respect to  $x$  and  $w$ .

**19.37** In order to solve the firm's intercountry joint profit maximization problem, it is necessary to consider two cases, depending on whether the rate of taxation in country 1 is higher than in country 2 or not.<sup>20</sup>

### **Case 1: Country 1 (the Importing Country) Is the Low Tax Country**

**19.38** In this case,

$$(19.19) T_1 < T_2$$

and the importing country is the low business income tax jurisdiction. Looking at the second line of (19.18), it can be seen that the term  $(T_1-T_2)wx$  is negative if  $w > 0$  and  $x > 0$ . Note also, that this is the only term where  $w$  appears. Hence to maximize overall profits, the multinational will want to choose  $w$  to be as *small as possible*. This will make profits in the low tax country (country 1) as big as possible compared to profits in the high tax country (country 2). If there are no constraints on the multinational, the optimal choice of  $w$  would be:<sup>21</sup>

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<sup>20</sup> If the rates of business income taxation are exactly the same so that  $T_1 = T_2$ , then (18) is equivalent to (8) in section C.2 and it does not matter what the firm chooses as its transfer price. The efficient transfer price  $w^{**}$  is still defined by (9) in this case.

<sup>21</sup> In this case, the multinational would choose  $x$  to satisfy  $(1-T_1)\partial r^1(p^1,x)/\partial x - (1-T_2)\partial c^2(p^2,x)/\partial x = 0$ , which would not lead to the efficient allocation defined in the previous section.

$$(19.20) w = 0.$$

**19.39** However, the tax authorities in country 2 will almost certainly object to the solution  $w = 0$ . A reasonable hypothesis in the case where losses can be carried forward to offset taxable income in future periods might be that the tax authorities in country 2 insist that the transfer price be high enough so that profits are zero in country 2. This leads to the following constraint on  $w$ :<sup>22</sup>

$$(19.21) wx = c^2(p^2, x).$$

**19.40** Adding (19.21) as a constraint to the multinational's profit maximization problem (19.18) leads to the following *global profit maximization problem*:

$$\begin{aligned} (19.22) \max_{x,w} \{ & (1-T_1)r^1(p^1, x) - (1-T_2)c^2(p^2, x) + (T_1-T_2)wx : wx = c^2(p^2, x) \} \\ & = \max_x \{ (1-T_1)r^1(p^1, x) - (1-T_2)c^2(p^2, x) + (T_1-T_2)c^2(p^2, x) \} && \text{eliminating } w \\ & = \max_x \{ (1-T_1)r^1(p^1, x) - (1-T_1)c^2(p^2, x) \} && \text{canceling terms} \\ & = (1-T_1) \max_x \{ r^1(p^1, x) - c^2(p^2, x) \}. \end{aligned}$$

**19.41** The last line of (19.22) shows that the multinational's global profit maximization problem under the zero profits constraint in the high tax country is *equivalent* to the efficient profit maximization problem defined by (19.8) in section C.2. Hence if the high tax country imposes a zero profits constraint on the transfer price, the multinational will end up making an efficient allocation of resources between the two countries.

**19.42** However, although the allocation of resources will be globally efficient in this case, the transfer price  $w^{***}$  that the multinational chooses in this case will usually be higher than the efficient transfer price  $w^{**}$  defined by (19.9) in the previous section. In order to establish this result, it is necessary to assume that when the allocation of resources is efficient and the efficient transfer price  $w^{**}$  is used, both establishments make positive profits; i.e., assume:<sup>23</sup>

$$(19.23) r^1(p^1, x^{**}) - w^{**}x^{**} > 0 ; w^{**}x^{**} - c^2(p^2, x^{**}) > 0.$$

**19.43** Now return to (19.22) and note that  $x^{**}$ , the efficient amount of trade, solves (19.22). However, instead of choosing the efficient transfer price  $w^{**}$  as in section C.2, the tax authorities in country 2 now force the multinational to choose the transfer price  $w^{***}$ , which satisfies the following equation:

$$(19.24) w^{***} \equiv c^2(p^2, x^{**})/x^{**}.$$

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<sup>22</sup> This method for choosing a transfer price is known as the *cost plus method* in the transfer pricing literature; see Eden (1998; 42).

<sup>23</sup> If there are constant returns to scale for establishment 1, then the first inequality in (23) becomes an equality; if there are constant returns to scale for establishment 2, then the second inequality in (23) becomes an equality.

Comparing (19.24) with the second equation in (19.23), it can be seen that the profit maximizing transfer price  $w^{***}$  will be less than the efficient transfer price  $w^{**}$  defined by (19.9); i.e., it has been shown that:

$$(19.25) \quad w^{***} < w^{**}.$$

**19.44** The result (19.25) was established under the hypothesis that the tax authorities in country 2 had enough knowledge about establishment 2's costs to be able to impose the zero profits constraint (19.21) on the transfer price. If the tax authorities do not have this knowledge, then there will be an incentive for the multinational to choose an even lower transfer price than  $w^{***}$  in order to transfer profits out of the high tax jurisdiction.

**19.45** In general, the results for the case where the rate of income taxation is lower in the importing country than the exporting country can be summed up by stating that the transfer price chosen by the multinational will generally be *lower* than the efficient transfer price and that it will no longer be the case that the chosen transfer price equals marginal cost in the exporting country or marginal revenue in the importing country. Hence the chosen transfer price will no longer represent true opportunity costs in the two countries and hence *is not a suitable price to be collected* if we are applying the economic approach to index number theory.<sup>24</sup>

**19.46** The next case to be considered is case 2:

### **Case 2: Country 2 (the Exporting Country) Is the Low Tax Country**

In this case,

$$(19.26) \quad T_1 > T_2$$

and the exporting country (country 2) is the low business income tax jurisdiction. Looking at the second line of (19.18), it can be seen that when (19.26) holds, the term  $(T_1 - T_2)wx$  is positive if  $w > 0$  and  $x > 0$ . As before, note that this is the only term where  $w$  appears. Hence to maximize overall profits, the multinational will want to choose  $w$  to be as *large as possible*. This will make profits in the low tax country (country 2) as big as possible compared to profits in the high tax country (country 1). If there are no constraints on the multinational, the optimal choice of  $w$  would be a very large number.

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<sup>24</sup> In the case where country 2 imposes the zero profits constraint (21), the "correct" price to collect from the viewpoint of the economic approach to index number theory is the efficient transfer price  $w^{**}$  defined by (9). In the general case where the business income tax authorities in one or both countries impose the arbitrary transfer price  $w^b$  on the multinational, the firm will choose the  $x^b$  that solves  $\max_x (1 - T_1)r^1(p^1, x) - (1 - T_2)c^2(p^2, x) + (T_1 - T_2)w^b x$ . In the differentiable case,  $x^b$  will satisfy the first order condition  $(1 - T_1)\partial r^1(p^1, x^b)/\partial x - (1 - T_2)\partial c^2(p^2, x^b)/\partial x = (T_1 - T_2)w^b$ . The economic transfer price that should be collected by the statistical agency in country 1 is the marginal revenue  $\partial r^1(p^1, x^b)/\partial x$  and the economic transfer price that should be collected by country 2 is the marginal cost  $\partial c^2(p^2, x^b)/\partial x$ .

**19.47** However, the tax authorities in country 1 may object to this arbitrarily large solution for  $w$ , since it would make taxable income in country 1 arbitrarily negative. A reasonable hypothesis in the case where losses can be carried forward to offset taxable income in future periods might be that the tax authorities in country 1 insist that the transfer price be low enough so that profits are zero in country 1. This leads to the following constraint on  $w$ :<sup>25</sup>

$$(19.27) \quad wx = r^1(p^1, x).$$

**19.48** Adding (19.27) as a constraint to the multinational's profit maximization problem (19.18) leads to the following *global profit maximization problem*:

$$\begin{aligned} (19.28) \quad & \max_{x,w} \{(1-T_1)r^1(p^1, x) - (1-T_2)c^2(p^2, x) + (T_1-T_2)wx : wx = r^1(p^1, x)\} \\ & = \max_x \{(1-T_1)r^1(p^1, x) - (1-T_2)c^2(p^2, x) + (T_1-T_2)r^1(p^1, x)\} && \text{eliminating } w \\ & = \max_x \{(1-T_2)r^1(p^1, x) - (1-T_2)c^2(p^2, x)\} && \text{canceling terms} \\ & = (1-T_2) \max_x \{r^1(p^1, x) - c^2(p^2, x)\}. \end{aligned}$$

**19.49** The last line of (19.28) shows that the multinational's global profit maximization problem under the zero profits constraint in the high tax country is *equivalent* to the efficient profit maximization problem defined by (19.8) in section C.2. Hence, if the high tax country imposes a zero profits constraint on the transfer price, the multinational will be induced to make an efficient allocation of resources between the two countries. However, although the allocation of resources will be globally efficient in this case, the transfer price  $w^{****}$  that the multinational chooses in this case will usually be *higher* than the efficient transfer price  $w^{**}$  defined by (19.9) in section C.2.

**19.50** In order to establish this result, it is necessary to assume that when the allocation of resources is efficient and the efficient transfer price  $w^{**}$  is used, both establishments make positive profits; i.e., assume again that (19.23) holds. When solving (19.28), instead of choosing the efficient transfer price  $w^{**}$ , the multinational now chooses the *profit maximizing transfer price*  $w^{****}$ , which is consistent with (19.28) when  $x = x^{**}$ ; i.e.,  $w^{****}$  satisfies the following equation:

$$(19.29) \quad w^{****} \equiv r^1(p^1, x^{**})/x^{**}.$$

**19.51** Comparing (19.29) with the first equation in (19.23), it can be seen that the profit maximizing transfer price  $w^{****}$  will be *greater* than the efficient transfer price  $w^{**}$  defined by (19.9); i.e., it has been shown that:

$$(19.30) \quad w^{****} > w^{**}.$$

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<sup>25</sup> This method for choosing a transfer price is roughly equivalent to the *resale price method* that is described in the transfer pricing literature as follows: "Under the resale price method, the tax auditor looks for firms at similar trade levels that perform similar distribution functions (i.e., a *functional comparable*). The RP method is best used when the distributor adds relatively little value to the product so that the value of its functions is easier to estimate." Lorraine Eden (1998; 40).

**19.52** The result (19.30) was established under the hypothesis that the tax authorities in country 1 had enough knowledge about establishment 1's costs to be able to impose the zero profits constraint (19.27) on the transfer price. If the tax authorities do not have this knowledge, then there will be an incentive for the multinational to choose an even higher transfer price than  $w^{***}$  in order to transfer profits out of the high tax jurisdiction.

**19.53** In general, the results for the case where the rate of business income taxation is lower in the exporting country than in the importing country can be summed up by stating that the transfer price chosen by the multinational (meeting the constraints imposed by the income tax authorities in both countries) will generally be *higher* than the efficient transfer price and that it will no longer be the case that the chosen transfer price equals marginal cost in the exporting country or marginal revenue in the importing country. Hence the chosen transfer price will no longer represent true opportunity costs in the two countries and hence *is not a suitable price to be collected* if we are applying the economic approach to index number theory.

**19.54** The above results rely somewhat on the ability of the tax authorities in the two jurisdictions to be able to determine either the appropriate cost in the exporting country or the appropriate net revenue or markup in the importing country. Needless to say, in actual practice, it is difficult to determine costs or markups accurately. In the cost context, Eden describes the situation as follows:

“In order to use the cost plus method, the tax authority or MNE [Multinational Enterprise] must know the accounting approach adopted by the unrelated parties. For example, what costs are included in the cost base before the mark-up over costs is calculated? Is it *actual cost* or *standard cost* (costs which have been standardized for cyclical fluctuations in production as in the example in Box 1.5)? Are only *manufacturing costs* (cost of goods sold, which includes labour, overhead costs, including depreciation, and material input costs) included or is the cost base the sum of manufacturing costs plus some portion of *operating costs* (i.e., selling, general and administrative (SG&A) expenses and R&D costs)? Lorraine Eden (1998; 42-43).

**19.55** There are additional problems in allocating the cost of capital to various products, including the problem of picking an appropriate benchmark rate of return to the firm's equity capital. Moreover, the problems involved in allocating joint costs over multiple outputs are difficult indeed.

**19.56** The main message that has been delivered in this section is this: when there are differential rates of business income taxation in the two countries where two units of a multinational engage in international trade, then the transfer prices that are reported by the multinational are unlikely to represent true opportunity costs. Hence if the statistical agency is using the economic approach to index number theory, these reported transfer prices will generally be biased (and the direction of bias is indicated above).

**19.57** In the following subsection, it is assumed that either business income taxation is absent in the two countries or that the rates are equal and instead, the focus is on the distortions induced by trade taxes.

## D.2 Transfer Pricing with Trade Taxes and No Income Taxes

**19.57** The multinational's profit maximization problem is now considered in the case where there is no external market for the commodity (as in the previous sections C.2 and D.1) and there are no business income taxes but there are *trade taxes*. It is assumed that the importing country (country 1) imposes a specific tax or tariff at the rate  $t_1$  and an ad valorem tax at the rate  $\tau_1$ <sup>26</sup> on each unit of  $x$  that is imported. It is also assumed that the exporting country (country 2) imposes a specific tax at the rate  $t_2$  and an ad valorem tax at the rate  $\tau_2$ <sup>27</sup> on each unit of  $x$  that is exported. If the multinational chooses the transfer price  $w > 0$ , then the multinational's *global profit maximization* problem is now:

$$(19.31) \max_{x,w} \{r^1(p^1,x) - w(1+\tau_1)x - t_1x\} + \{w(1-\tau_2)x - t_2x - c^2(p^2,x)\} \\ = \max_{x,w} r^1(p^1,x) - c^2(p^2,x) - (t_1 + t_2)x - w(\tau_1 + \tau_2)x.$$

**19.58** Comparing (19.31) with the no tax profit maximization problem (19.8) in section C.2, it can be seen that there are two differences:

- The ad valorem trade tax rates,  $\tau_1$  and  $\tau_2$ , and the specific trade taxes,  $t_1$  and  $t_2$ , lead to the terms  $(t_1 + t_2)x$  and  $w(\tau_1 + \tau_2)x$  in the objective function. In particular, the terms involving the transfer price  $w$  no longer cancel out as they did in (19.9) and
- The multinational now is now able to choose the transfer price  $w$  as well as the level of international trade in the intermediate input  $x$ ; i.e., instead of just maximizing with respect to  $x$ , the firm now maximizes with respect to  $x$  and  $w$ .

**19.59** In order to solve the firm's global profit maximization problem, it is necessary to consider two cases, depending on whether the ad valorem trade taxes are jointly positive (this is the usual case) or jointly negative.

### Case 1: Ad Valorem Trade Taxes Are Jointly Positive

In this case,

$$(19.32) \tau_1 + \tau_2 > 0.$$

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<sup>26</sup> If the imports are subsidized by country 1, then  $t_1$  and  $\tau_1$  are negative or zero.

<sup>27</sup> If the exports are subsidized by country 2, then  $t_2$  and  $\tau_2$  are negative or zero. Of course, some of these tax or subsidy rates could be 0.

**19.60** Looking at the second line of (19.31), it can be seen that the term  $-w(\tau_1+\tau_2)x$  is negative in this case. Note also, that this is the only term where  $w$  appears. Hence to maximize overall profits, the multinational will want to choose  $w$  to be as *small as possible*. If there are no constraints on the multinational, the optimal choice of  $w$  would be  $w = 0$ .<sup>28</sup> However, the trade tax authorities in at least one of the countries would almost certainly object to the solution  $w = 0$ . It is difficult to specify what transfer price the border tax officials will impose;<sup>29</sup> hence, it will be assumed that it is some positive number, say  $w^b > 0$ .

**19.61** With this exogenous choice  $w^b$  for the transfer price  $w$ , the multinational's profit maximization problem (19.31) becomes:

$$(19.33) \max_x r^1(p^1, x) - c^2(p^2, x) - (t_1 + t_2)x - w^b(\tau_1 + \tau_2)x.$$

**19.62** If the revenue and cost functions are differentiable and if  $x^b$  solves (19.33), then the following first order condition will be satisfied:

$$(19.34) \partial r^1(p^1, x^b)/\partial x - \partial c^2(p^2, x^b)/\partial x = (t_1 + t_2) + w^b(\tau_1 + \tau_2).$$

**19.63** If by chance, the sum of the *trade distortion terms* on the right hand side of (34) is equal to zero so that

$$(19.35) (t_1 + t_2) + w^b(\tau_1 + \tau_2) = 0,$$

then it can be seen that the solution to (19.33) is the efficient solution  $x^{**}$  to (19.8); i.e., under assumption (19.35), it can be shown that  $x^b = x^{**}$  and using (19.34), it is also the case that

$$(19.36) \partial r^1(p^1, x^b)/\partial x = \partial c^2(p^2, x^b)/\partial x \equiv w^{**}$$

so that marginal revenue and marginal cost in the two establishments will be equal to the efficient transfer price  $w^{**}$ .

**19.64** However, even in the case where (19.35) holds, it will not generally be the case that the imposed transfer price  $w^b$  is equal to  $w^{**}$ . Hence, in general:

$$(19.37) \partial r^1(p^1, x^b)/\partial x \neq w^b ; \partial c^2(p^2, x^b)/\partial x \neq w^b.$$

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<sup>28</sup> In this case, the multinational would choose  $x$  to satisfy  $\partial r^1(p^1, x)/\partial x - \partial c^2(p^2, x)/\partial x = (t_1 + t_2)$ , which would not lead to the efficient allocation defined in section C.2 unless the sum of the specific taxes were equal to zero; i.e., unless  $(t_1 + t_2) = 0$ .

<sup>29</sup> The border tax authorities will usually not have access to the information possessed by the tax authorities in the two countries and so it will be difficult for them to impose the zero profits constraint on either establishment as in the previous section. The transfer price  $w^b$  may not actually be *imposed* by the border trade authorities but it must be *acceptable* to them.

**19.65** In the general case where  $(t_1 + t_2) + w^b(\tau_1 + \tau_2) \neq 0$ , then it will still be the case that the inequalities in (19.37) will hold; i.e., in this case, it would only be by chance that marginal revenue or marginal cost in the two establishments equals the border authorities' acceptable transfer price  $w^b$ . Since the economic approach to index number theory requires that the transfer price in establishment 1 be set equal to the marginal revenue  $\partial r^1(p^1, x^b)/\partial x$  and the transfer price in establishment 2 be set equal to the marginal cost  $\partial c^2(p^2, x^b)/\partial x$ , it can be seen that *the transfer price that is acceptable to the border tax authorities will not usually be an acceptable one for statistical purposes.*

**19.66** Case 2 is now considered.

### **Case 2: Ad Valorem Trade Taxes Are Jointly Negative**

In this case,

$$(19.38) \tau_1 + \tau_2 < 0.$$

**19.67** Looking at the second line of (19.31), it can be seen that the term  $-w(\tau_1 + \tau_2)x$  is positive in this case. Note, as in the previous case, that this is the only term where  $w$  appears. Hence to maximize overall profits, the multinational will want to choose  $w$  to be as *large as possible*. If there are no constraints on the multinational, the optimal choice of  $w$  would be an arbitrarily large.

**19.68** However, the trade tax authorities in at least one of the countries would almost certainly object to this arbitrarily large transfer price and so again, they will (explicitly or implicitly) impose some acceptable transfer price  $w^b > 0$ . With this exogenous choice for the transfer price  $w$ , the multinational's profit maximization problem (19.31) becomes (19.33) and the rest of the analysis proceeds as in the previous case. Thus there is little difference in this case compared to the previous case except in the present case, the multinational will want to choose an acceptable transfer price  $w^b$  that is as *large* as possible, whereas in the previous case, the multinational wanted to choose an acceptable transfer price that was as *small* as possible. In either case, it can be seen that *the transfer price that is acceptable to the border tax authorities will not usually be an acceptable one for statistical purposes.*

**19.69** The analysis presented in section D shows that the considerations that go into choosing transfer prices are very complex and are mainly driven by the desire of multinational firms to minimize both trade taxes and business income taxes.<sup>30</sup> On the other hand, governments have strong incentives to force multinationals to choose transfer prices

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<sup>30</sup> The analytic framework presented in sections D.1 and D.2 can be combined to cover situations where there are both trade taxes and business income taxes. This is done in Eden (1998; 302-305) and in Diewert, Alterman and Eden (2005). However, for present purposes, it is not necessary to present this material: the reader can already see that with both trade and income taxes present, the transfer prices chosen by multinationals are unlikely to be suitable for statistical purposes.

that will enhance their tax revenues. Moreover, often the tax authorities in the same country can have opposing incentives to impose either a high or low transfer price: in order to maximize ad valorem tariff revenue, the customs authorities in the importing country may want to impose a transfer price that is as high as possible while the business income tax authorities in the same country may want to impose a transfer price that is as low as possible! What should the international trade price statistician do under these circumstances? Some suggested answers are presented in the following section.

## **E. Which Transfer Prices Can Be Usefully Collected by Statistical Agencies?**

### **E.1 General Considerations**

**19.70** As can be seen from the above material, the validity of using transfer prices, either one reported by the respondent or one constructed by from outside, is rather suspect. The price associated with a transaction between unaffiliated parties reveals very useful information. In this situation, one party wishes to make the price as small as possible while the other party wishes to make it as large as possible. For the minimizing party (the importer), the price should not exceed the marginal revenue that can be generated by the last unit of the imported commodity. For the maximizing party (the exporter), the price should not be less than the full marginal cost of producing the last unit of the sale. However, the transfer price that is used to value international trades between affiliated establishments in general tells us nothing about marginal costs and marginal revenues: this transfer price will be chosen *strategically* by a profit maximizing multinational in order to maximize its global after-tax profits. Hence, in general, it will not be useful for a statistical agency to collect such a strategically chosen transfer price. Nor would it be easy to construct one. What then should be collected?

**19.71** For income taxation and customs valuation purposes, the OECD Transfer Pricing Guidelines (OECD, 1995) recommend multinational enterprises and national tax authorities follow the *arm's length standard*, that is, set the transfer price equal to the price that two unrelated parties would negotiate when trading the same or substantially similar products under the same or substantially similar circumstances.

**19.72** All OECD countries, and many non-OECD member countries, follow the OECD Guidelines by requiring multinationals to report their transfer prices using the *best method* (that is, the most appropriate method given the facts and circumstances) selected from a set of acceptable transfer pricing methods; see Eden (1998; 549-561) and Feinschreiber (2004). Key to selection of the best method is the concept of *comparability*. Transactions are considered comparable when their “economically relevant characteristics” are the same, or if they differ, the differences have no material impact on the results. The attributes of a transaction that can affect comparability are (OECD, 1995, Chapter I. paragraphs 1.15-1.17):

- Specific characteristics of the traded product (e.g., weight, quality, product maturity, whether intangibles are bundled with tangibles)

- Functions performed by the parties to the transaction (e.g., manufacturing, distribution, purchasing, marketing)
- Contractual terms of the transaction (e.g., warranties, rights, payment and credit terms)
- Economic circumstances of the parties (e.g., wholesale versus retail level, geographic location and relative size of the markets, market competition)
- Business strategies of the parties (e.g., market penetration strategies)

**19.73** In practice, since internal and external transactions are unlikely to be exact comparables, the OECD Guidelines recommend that material differences be identified, quantified and adjusted for in determining the arm's length transfer price. Moreover, since transfer pricing is not an exact science, the Guidelines recommend that transfer prices be set inside a range of acceptable arm's length prices, called the *arm's length range*.

**19.74** The arm's length transfer price can be measured using either an internal comparable or external comparable to the intra-firm transaction. An *internal or in-house comparable* is a product traded by the multinational on both the internal and external markets, under substantially the same or similar circumstances. For example, a Ford affiliate might buy an auto part from a sister subsidiary and also buy the same part from an arm's length supplier. An *external comparable* is a transaction, similar to the intra-firm transaction, which occurs between two unrelated firms. For example, the transfer price for an auto part traded between two Ford affiliates could be proxied by an arm's length transaction between Toyota and General Motors.

**19.75** Tax authorities typically view an internal or in-house comparable where the multinational sells (buys) the same product from an unaffiliated firm as it sells (buys) in-house as having a higher degree of comparability, in general, than an external comparable. There is a higher probability that the facts and circumstances are the same or similar (or, alternatively, a lower probability of potential errors and omissions) for in-house comparables, and thus, the "economically relevant characteristics of the transaction" are more likely to be the same.

**19.76** There are five acceptable transfer pricing methods for *income tax purposes* in many jurisdictions: comparable uncontrolled price (CUP), the cost plus method, the resale price (minus) method, the transactional net margin method (TNMM)<sup>31</sup> and the profit split method.<sup>32</sup> *Customs authorities* typically require merchandise imports to be priced using one of three methods: transaction value (equivalent to CUP)<sup>33</sup>, computed value (similar to cost plus)<sup>34</sup> or

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<sup>31</sup> In the United States, TNMM is replaced by the comparable profit method (CPM). The IRS argues that the two methods are basically equivalent. Others argue there are recognizable differences. See Eden (1998) and Feinschreiber (2004).

<sup>32</sup> All of these methods are described in more detail in Eden (1998).

<sup>33</sup> This corresponds to the external market price w described in section C.1.

deductive value (similar to resale price).<sup>35</sup> Most national tax authorities, but not all (e.g., the U.S.), rank these methods, with CUP for income tax purposes and transaction value for customs valuation being preferable to the others because they most closely fulfill the conditions required by the arm's length standard.

**19.77** The reasoning developed by income tax and customs valuation authorities should have relevance for statistical agencies. While their purposes in collecting transfer prices may not be the same, the agencies share a desire for pricing to reflect economically relevant characteristics of the market. This line of reasoning is followed below, in developing recommendations for selecting transfer prices to be used in international price index programs.

**19.78** Because an international prices program produces *indexes* rather than *actual prices*, the statistical agency's goals are somewhat different from those of income tax and customs authorities. First, in the case of taxes and tariffs, the relevant agencies do want to know the exact price paid or payable in order to determine the applicable tax on the transaction or profits from the transaction. The arm's length standard is designed to ensure that the multinational sets a transfer price that proxies the price that would be selected by unrelated firms. Second, customs and tax authorities are interested in a particular firm and taxing its transactions or profits.

**19.79** On the other hand, for the purpose of calculating national export and import price indexes, actual transaction prices are required as the first step in calculating *price changes of product groups (ELIs, entry level items) aggregated across firms*. Thus, *movements* in prices are more important than the *level* of prices, and *representative* firms and transactions are more important than any *individual* firm or transaction. Thus, the appropriate transfer pricing methods for calculating international price indexes may differ somewhat from those for paying income taxes and customs duties, even if all three agencies adhere to the arm's length standard. With these considerations in mind, possible price collection strategies for exports and imports are explored in sections E.2 and E.3 below.

## **E.2 Collecting Transfer Prices for Exports**

**19.80** For an *exporting establishment*, the following ordering of alternative collection strategies is recommended, in order of their merit, starting with the best method first. The ranked methods are:

- Internal comparable;
- Externally referenced comparable;
- External comparable;

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<sup>34</sup> This corresponds to the transfer price defined by (24).

<sup>35</sup> This corresponds to the transfer price defined by (29).

- Downstream (or upstream) internal transactions; and the
- Declared transfer price.

Each of these alternatives is explained in more detail in the paragraphs below.

**19.81 (a) *Internal Comparable*:** If the same or a sufficiently similar product is sold by the multinational, under the same or substantially similar circumstances, to an unaffiliated third party during the reference period, use that price<sup>36</sup> for the sales of the commodity to affiliated parties rather than the transfer price. Where the same product is exported under the same circumstances to both affiliated and unaffiliated firms, there is an *exact internal comparable* (or *exact internal CUP*)<sup>37</sup> transaction. Where the circumstances are sufficiently similar and differences can be identified, quantified and adjusted, there is an *inexact internal comparable* (or *inexact internal CUP*). It does not matter whether the unaffiliated sales are domestic or international for most purposes, as long as differences can be identified, quantified and adjusted for. Exact comparables are, of course, preferable to inexact comparables, where they exist.

**19.82 (b) *Externally Referenced Comparable*:** If alternative (a) is not available, but there is a recognized domestic or international exchange (e.g., the London Metal Exchange, the Chicago Mercantile Exchange) that trades in the product, use the corresponding price on the exchange for the reference period, making any necessary adjustments to ensure that the economically relevant characteristics of the transactions are sufficiently similar. It does not matter whether the reference exchange is domestic or international for most purposes, as long as differences can be identified, quantified and adjusted for.<sup>38</sup>

**19.83 (c) *External Comparable*:** If alternatives (a) and (b) are not available, attempt to find a foreign or domestic market price for the product traded between two unaffiliated traders under the same or substantially similar circumstances, and make adjustments for any material differences.<sup>39</sup> It does not matter whether the external transaction is domestic or international for most purposes, as long as differences can be identified, quantified and adjusted for.

**19.84 (d) *Downstream (and Upstream) Internal Transactions*:** If alternatives (a), (b) and (c) are not available, then attempt to collect the first arm's length price of a downstream product

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<sup>36</sup> It may be necessary to make adjustments for transport costs and alternative tax treatments.

<sup>37</sup> For example, suppose Ford-US exports finished cars to an affiliated distributor in Germany and to an arm's length distributor in France. If wholesale trade between France and Germany in finished cars is unrestricted, it may be possible to use the arm's length price in France, adjusted for material differences, to proxy for the transfer price to the German affiliate.

<sup>38</sup> The primary differences are likely to be additional costs for transportation, insurance and foreign currency transactions.

<sup>39</sup> Such prices may be available from the country's Producer Price Index program or from industry sources. Note that this strategy might imply a cooperative collection strategy with other countries.

that uses the intermediate good as a major input. In some cases, the intra-firm transaction will be in unfinished parts or subassemblies that undergo further processing in the foreign affiliate prior to final sale. If the final product is sold through different channels to many downstream buyers, possibly located in different countries, it may be difficult to trace and identify appropriate transactions for comparison purposes. In such cases, it may be possible to trace downstream transactions in the domestic market. The closer the exported product is to final sale, the more likely it should be to obtain downstream internal comparables.<sup>40</sup>

**19.85 (e) Declared Transfer Price:** If none of the above alternatives is available, the international price program should collect the exporting firm's listed transfer price along with a brief description of its type. The data collector should also determine if the transfer price is market-based or cost-based. If the latter, the collector should identify whether a profit component is attached or not (the "plus" in cost plus, as compared to standard or actual cost without any "plus").<sup>41</sup>

### **E.3 Collecting Transfer Prices for Imports**

**19.86** For an *importing establishment*, the following ordering of alternative collection strategies is recommended, in order of their merit, starting with the best method first. The ranked methods are:

- Internal comparable;
- Externally referenced comparable;
- External comparable;
- Downstream (or upstream) internal transactions; and the
- Declared transfer price.

Each of these alternatives is explained in more detail in the paragraphs below.

**19.87 (a) Internal Comparable:** If the *same commodity* is purchased from an unaffiliated third party during the reference period, then use that price<sup>42</sup> for the purchases of the

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<sup>40</sup> It may also be possible to determine an arm's length price by going upstream from the intrafirm transaction. This would be appropriate only in cases where little additional value is added in moving to the downstream stage. This situation resembles the cost plus method, whereby a gross profit margin for arm's length firms is added to costs to determine the transfer price. For the purposes of an international prices program, the relevant question is whether upstream costs move in a similar fashion to costs of the intrafirm product. For example, related prices collected for a domestic Producer Price Index might be a relevant substitute for some intrafirm transactions where there are no external comparables.

<sup>41</sup> Most intermediate transfers are at mandated full costs for cost centers, and at full cost plus a profit mark-up for profit centers; see Feinschreiber (2004; 18). It would also be useful to know whether the affiliate had the responsibility for setting the transfer pricing, either wholly or shared with its trading partner, or whether the transfer price was mandated by the parent firm.

<sup>42</sup> It may be necessary to make adjustments for transport costs and alternative tax treatments.

commodity from affiliated parties rather than the transfer price. It does not matter whether the unaffiliated purchases are domestic or international for most purposes. Where the same product is imported under the same circumstances from both an affiliated and an unaffiliated firm, there is an *exact internal comparable*. Where the circumstances are sufficiently similar and differences can be identified, quantified and adjusted, there is an *inexact internal comparable*. It does not matter whether the unaffiliated purchases are domestic or international for most purposes, as long as differences can be identified, quantified and adjusted for. Exact internal comparables are, of course, preferable to inexact internal comparables, where they exist.

**19.88** (b) *Externally Referenced Comparable*: If alternative (a) is not available, but there is a recognized domestic or international exchange (e.g., the London Metal Exchange, the Chicago Mercantile Exchange) that trades in the product, use the price on the exchange for the reference period, making any necessary adjustments to ensure that the economically relevant characteristics of the transactions are sufficiently similar. It does not matter whether the reference exchange is domestic or international for most purposes, as long as differences can be identified, quantified and adjusted for.

**19.89** (c) *External Comparable*: If alternatives (a) and (b) are not available, attempt to find a foreign or domestic market price for the product traded between two unaffiliated traders under the same or substantially similar circumstances, and make adjustments for any material differences. It does not matter whether the external transaction is domestic or international for most purposes, as long as differences can be identified, quantified and adjusted for.

**19.90** (d) *Downstream (or Upstream) Internal Transactions*: If alternatives (a), (b) and (c) are not available, then attempt to collect the first arm's length price of a downstream product that uses the intermediate good as a major input. In the simplest case, the imported good will be a finished good and the downstream sale will be to arm's length distributors.<sup>43</sup> In more complex cases, the intra-firm transaction will be in unfinished parts or subassemblies that undergo further processing in the importing affiliate prior to final sale. It is possible in such cases that the final product will be sold through different channels to many downstream buyers, not only in the U.S. but abroad, making it difficult to trace and identify appropriate transactions for comparison purposes. The closer the imported product is to the finished stage, the more likely it should be to obtain downstream internal comparables. Again, similar to the situation with exports, it may be possible to find arm's length upstream prices that can be used to replace the transfer price of the imported product (but this would typically involve cooperation on the part of statistical agencies in the exporting country although internet search for prices is a possibility).

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<sup>43</sup> For example, if Toyota-Japan sells a finished car to Toyota-US, the IPP should collect the selling price from Toyota-US to an unaffiliated Toyota dealer in the United States and adjust for the difference in trade levels. While this looks similar to the resale price method for tax and customs duty purposes, the key difference is that the import price index is not interested in calculating the gross margin, per se, but rather in whether movements of the downstream price to the arm's length U.S. distributor is a good proxy for movements in the transfer price of exported finished cars from Toyota-Japan to Toyota-US.

**19.91** (e) *Declared Transfer Price*: If none of the above alternatives is available, the international price program should collect the importing firm's listed transfer price along with a brief description of its type. The data collector should also determine if the transfer price is market-based or cost-based. If the latter, the collector should identify whether a profit component is attached or not.

#### **E.4 Practical Issues in Selecting the Best Method**

**19.92** The above two sections have outlined, and ranked, five methods for determining an acceptable transfer price for constructing international price indexes: (a) internal comparable, (b) externally referenced price, (c) external comparables, (d) downstream (and possibly upstream) internal transactions, and (e) the declared transfer price. In this section, some of the issues of moving from theory to practice are discussed.

**19.93** First, note that the transfer pricing methods outlined above bear a close resemblance to those recommended by the OECD Transfer Pricing Guidelines in that they stress the importance of comparing economically relevant characteristics, and typically (but not always) prefer internal to external comparables. *In such cases, if the multinational states that its transfer price does follow the same method as the home country statistical agency is attempting to collect, that transfer price should be collected.* For example, collection strategy (a), Internal Comparables, is the top preferred method for intrafirm exports. If the multinational states that its transfer price is based on an exact or inexact internal comparable, the transfer price should be collected by the statistical agency.

**19.94** Second, in comparing which collection strategy should be selected by the statistical agency, the issues of *feasibility and administrative costs* are important considerations. For example, suppose the multinational respondent states that its declared transfer price follows method (b), an External Comparable on a Reference Exchange. While method (a), Internal Comparable, is theoretically preferable, the costs and time involved in collecting this information may outweigh the additional reliability. The statistical agency should, in these situations, collect the declared transfer price that follows method (b), even where in theory method (a) is preferable. Similarly, if the multinational's transfer price is based on method (c), accepting that transfer price may be preferable to the additional time and costs involved in determining the arm's length price using method (a) or (b).<sup>44</sup>

**19.95** Third, it might be thought that the multinational's posted transfer price would be acceptable for statistical purposes, provided that the multinational uses the *same* set of transfer prices for both management and tax purposes. In a recent survey, Ernst and Young (2001; 6) report that 77% of multinationals responding to their survey used the same set of

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<sup>44</sup> Moreover, given the reluctance of firms to share transfer pricing information when compliance is voluntary, the statistical agency may fail to collect any price if the firm perceives a request for detailed information as a 'fishing expedition' or something that could potentially be used by another agency to collect more income or trade taxes.

transfer prices for both purposes,<sup>45</sup> which seems encouraging at first glance since transfer prices for managerial purposes should approximate economic transfer prices based on opportunity costs. However, the same Ernst and Young survey also reveals that these dual purpose transfer prices are frequently heavily influenced by tax considerations.<sup>46</sup> Thus, the existence of one – as opposed to two – sets of books is insufficient justification for accepting the multinational’s stated transfer price for purposes of calculating export and import price indexes. Rather, the key issue is whether the multinational uses an economically acceptable transfer pricing methodology.

**19.96** Fourth, although in most cases, strategy (a) will be preferred, there are circumstances when this strategy may not be very reliable, such as:

- The sales to the unaffiliated parties are relatively small and sold at prices that are “abnormally” high or low.

**19.97** Finally, if there are no sales to unaffiliated parties during the reference period, then as indicated above, it was recommended that methods (b) or (c) should be used. However, these (b) and (c) collection strategies can fail under some circumstances:

- The exporting establishment may be shipping a proprietary product to units of a multinational firm in other countries for further processing and there is no openly traded market for the product anywhere in the world.<sup>47</sup>
- The open market for trades in the product may be small and unrepresentative of the bulk of the trades in the commodity or price movements in this open market could be very volatile.

## F. Conclusion

**19.98** The theoretical parts of this chapter attempted to show above that in a world where there are taxes on international transactions or where the rates of business income taxation differ across countries, then a multinational enterprise has financial incentives to *choose strategically* a transfer price to reduce the amount of taxation paid in the importing and

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<sup>45</sup> “According to the 2001 survey responses, over three quarters of MNC parents (77%) reported using the same set of transfer prices for both tax and management purposes.” Ernst and Young (2001; 6).

<sup>46</sup> “Of those using the same transfer price, about half (52%) use a compromise between satisfying tax requirements and achieving management/operational objectives, while a quarter (26%) and a fifth (21%) base it primarily on tax management/operations respectively.” Ernst and Young (2001; 6).

<sup>47</sup> In this case, if the proprietary product is a major component of a product that is traded between unaffiliated parties, then the price of this latter product could be used as a proxy for the transfer price.

exporting countries. This strategically chosen transfer price will generally be very different from an economic transfer price (based on opportunity costs) that would be suitable for an import or export price index. Since international trade between affiliated units is somewhere in the neighborhood of 30 to 40 percent of world trade, it can be seen that this problem of determining appropriate transfer prices is a huge one.

**19.99** The first best alternative to the firm's listed transfer price is an internal comparable; that is, the average price paid to (for an imported commodity) or received from (for an exported commodity) unaffiliated firms for the same commodity during the reference period, if such unaffiliated purchases or sales exist. If there are no such unaffiliated purchases or sales, then the use of an externally referenced comparable was recommended, that is, the price of the commodity on a recognized exchange that trades in the commodity if such an exchange exists. If no such exchange exists, then attempting to find an external comparable price based on transactions between unaffiliated traders was recommended. These three methods all focus on the price of the same product traded by different firms. Where this is impossible, the price collector could look at downstream prices, or potentially upstream prices, to see whether an economically acceptable price can be found. Finally, if there are no internal or external comparables, at the same or different levels of the value chain, the international price index should use the multinational's stated transfer price.

**19.100** The above recommendations for the collection of transfer prices may appear to be somewhat radical, given that it was recommended that the multinational's listed transfer prices only be used as a last resort. Since the multinational must develop and use transfer prices that meet the arm's length standard, for both income tax and customs duty valuation purposes, it is possible that the declared transfer price does satisfy one of the preferred recommended methods. However, a multinational that is attempting to maximize its after-tax profits has an incentive to choose relatively extreme transfer prices that will reduce its tax liabilities, suggesting that the reported transfer price may not meet any of the best method tests outlined above. Even in this situation, both time and financial constraints may change the ranking of the acceptable methods or make the multinational's stated transfer price the only practical alternative.

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