22-23 Multinational transfer pricing, global tax minimization.

1. Solution Exhibit 22-23 shows the after-tax operating incomes earned by the U.S. and Austrian divisions from transferring 10,000 units of Product 4A36 using (a) full manufacturing cost per unit, and (b) market price of comparable imports as transfer prices.

2. There are many ways to proceed, but the first thing to note is that the transfer price that minimizes the total of company import duties and income taxes will be either the full manufacturing cost or the market price of comparable imports.

   Consider what happens every time the transfer price is increased by $1 over, say, the full manufacturing cost of $800. This results in the following change for each unit:

   a. an increase in U.S. taxes of 35% × $1  
      $0.35
   b. an increase in import duties paid in Austria, 15% × $1  
      0.15
   c. a decrease in Austrian taxes of 40% × $1.15  
      (the $1 increase in transfer price + $0.15 paid by way of import duty)  
      (0.46)
   Net effect is an increase in import duty and tax payments of:  
      $0.04

   To verify this solution, note that if the transfer price changes from $800 to $950, the net effect is an increase in import duty and tax payments of ($950 - $800) × $0.04 = $6 per unit. Across 10,000 units, this implies a decrease in total profits of (10,000) × $6 = $60,000, which corresponds exactly to the $60,000 difference in total after-tax operating incomes documented in Solution Exhibit 22-23.

Hence, Mornay Company will minimize import duties and income taxes by setting the transfer price at its minimum level of $800, the full manufacturing cost.
**SOLUTION EXHIBIT 22-23**
Division Incomes of U.S. and Austrian Divisions from Transferring 10,000 Units of Product 4A36

<table>
<thead>
<tr>
<th></th>
<th>Method A</th>
<th>Method B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internal Transfers</td>
<td>Internal Transfers</td>
</tr>
<tr>
<td></td>
<td>at Full Manufacturing Cost</td>
<td>at Market Price</td>
</tr>
<tr>
<td><strong>U.S. Division</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues:</td>
<td>$800, $950 \times 10,000 units</td>
<td>$9,500,000</td>
</tr>
<tr>
<td>Costs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full manufacturing cost:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$800 \times 10,000 units</td>
<td>$8,000,000</td>
</tr>
<tr>
<td></td>
<td>Division operating income</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Division income taxes at 35%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Division after-tax operating income</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Austrian Division</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues:</td>
<td>$1,150 \times 10,000 units</td>
<td>$11,500,000</td>
</tr>
<tr>
<td>Costs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transferred-in costs:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$800 \times 10,000, $950 \times 10,000 units</td>
<td>8,000,000</td>
</tr>
<tr>
<td></td>
<td>Import duties at 15% of transferred-in price</td>
<td>9,500,000</td>
</tr>
<tr>
<td></td>
<td>$120 \times 10,000, $142.50 \times 10,000 units</td>
<td>1,200,000</td>
</tr>
<tr>
<td></td>
<td>Total division costs</td>
<td>9,220,000</td>
</tr>
<tr>
<td></td>
<td>Division operating income</td>
<td>2,300,000</td>
</tr>
<tr>
<td></td>
<td>Division income taxes at 40%</td>
<td>920,000</td>
</tr>
<tr>
<td></td>
<td>Division after-tax operating income</td>
<td>$1,380,000</td>
</tr>
<tr>
<td>Sum of divisional after-tax operating incomes</td>
<td>$1,380,000</td>
<td>$1,320,000</td>
</tr>
</tbody>
</table>
22-24 Multinational transfer pricing, goal congruence (continuation of 22-23).

1. After-tax operating income if Mornay Company sells all 10,000 units of Product 4A36 in the United States:

   Revenues, $900 \times 10,000 \text{ units} = 9,000,000$
   Full manufacturing costs, $800 \times 10,000 \text{ units} = 8,000,000$
   Operating income = 1,000,000
   Income taxes at 35% = 350,000
   After-tax operating income = $650,000

   From Exercise 22-23, requirement 1, Mornay Company’s after-tax operating income if it transfers 10,000 units of Product 4A36 to Austria at full manufacturing cost and sells the units in Austria is $1,380,000. Therefore, Mornay should sell the 10,000 units in Austria.

2. Transferring Product 4A36 at the full manufacturing cost of the U.S. Division minimizes import duties and taxes (Exercise 22-23, requirement 2), but creates zero operating income for the U.S Division. Acting autonomously, the U.S. Division manager would maximize division operating income by selling Product 4A36 in the U.S. market, which results in $650,000 in after-tax division operating income as calculated in requirement 1, rather than by transferring Product 4A36 to the Austrian division at full manufacturing cost. Thus, the transfer price calculated in requirement 2 of Exercise 22-23 will not result in actions that are optimal for Mornay Company as a whole.

3. The minimum transfer price at which the U.S. division manager acting autonomously will agree to transfer Product 4A36 to the Austrian division is $900 per unit. Any transfer price less than $900 will leave the U.S. Division's performance worse than selling directly in the U.S. market. Because the U.S. Division can sell as many units as it makes of Product 4A36 in the U.S. market, there is an opportunity cost of transferring the product internally equal to $350 (selling price $900 – variable manufacturing costs, $550).

\[
\text{Minimum transfer price per unit} = \text{Incremental cost per unit up to the point of transfer} + \text{Opportunity cost per unit to the selling (U. S.) division}
\]

\[
= 550 + 350 = 900
\]

This transfer price will result in Mornay Company as a whole paying more import duties and taxes than the answer to Exercise 22-23, requirement 2, as calculated below:

\[
\begin{align*}
\text{U.S. Division} \\
\text{Revenues, } $900 \times 10,000 \text{ units} & \quad 9,000,000 \\
\text{Full manufacturing costs} & \quad 8,000,000 \\
\text{Division operating income} & \quad 1,000,000 \\
\text{Division income taxes at 35\%} & \quad 350,000 \\
\text{Division after-tax operating income} & \quad 650,000
\end{align*}
\]
Austrian Division

Revenues, $1,150 \times 10,000$ units’ $\quad$ $11,500,000$

Transferred in costs, $900 \times 10,000$ units $\quad$ 9,000,000

Import duties at 15\% of transferred-in price, $\quad$
$\quad$ $135 \times 10,000$ units $\quad$ 1,350,000

Division operating income $\quad$ 1,150,000

Division income taxes at 40\% $\quad$ 460,000

Division after-tax operating income $\quad$ $690,000$

Total import duties and income taxes at transfer prices of $800 and $900 per unit for 10,000 units of Product 4A36 follow:

<table>
<thead>
<tr>
<th>Transfer Price of $800 per Unit (Exercise 22-23, Requirement 2)</th>
<th>Transfer Price of $900 per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) U.S. income taxes</td>
<td>$0</td>
</tr>
<tr>
<td>(b) Austrian import duties</td>
<td>1,200,000</td>
</tr>
<tr>
<td>(c) Austrian income taxes</td>
<td>920,000</td>
</tr>
<tr>
<td></td>
<td>$2,120,000</td>
</tr>
</tbody>
</table>

The minimum transfer price that the U.S. division manager acting autonomously would agree to results in Mornay Company paying $40,000 in additional import duties and income taxes.

A student who has done the calculations shown in Exercise 22-23, requirement 2, can calculate the additional taxes from a $900 transfer price more directly, as follows:

Every $1 increase in the transfer price per unit over $800 results in additional import duty and taxes of $0.04 per unit

So, a $100 increase ($900 – $800) per unit will result in additional import duty and taxes of $0.04 \times 100 = $4.00

For 10,000 units transferred, this equals $4.00 \times 10,000 = $40,000
22-27 General guideline, transfer pricing.

1. The minimum transfer price that the SD would demand from the AD is the net price it could obtain from selling its screens on the outside market: $100 minus $8 marketing and distribution cost per screen, or $92 per screen. The SD is operating at capacity. The incremental cost of manufacturing each screen is $65. Therefore, the opportunity cost of selling a screen to the AD is the contribution margin the SD would forego by transferring the screen internally instead of selling it on the outside market.

   Contribution margin per screen = $92 – $65 = $27

Using the general guideline,

   \[
   \text{Minimum transfer price per screen} = \text{Incremental cost per screen incurred up to the point of transfer} + \text{Opportunity cost per screen to the selling division}
   \]

   \[
   = \$65 + \$27 = \$92
   \]

2. The maximum transfer price the AD manager would be willing to offer SD is its own total cost for purchasing from outside, $100 plus $7 per screen, or $107 per screen.

3a. If the SD has excess capacity (relative to what the outside market can absorb), the minimum transfer price using the general guideline is: for the first 6,000 units (or 30% of output), $65 per screen because opportunity cost is zero; for the remaining 14,000 units (or 70% of output), $92 per screen because opportunity cost is $27 per screen.

3b. From the point of view of Slate’s management, all of the SD’s output should be transferred to the AD. This would avoid the $7 per screen variable purchasing cost that is incurred by the AD when it purchases screens from the outside market and it would also save the $8 marketing and distribution cost the SD would incur to sell each screen to the outside market.

3c. If the managers of the AD and the SD could negotiate the transfer price, they would settle on a price between the minimum transfer price the SD will accept (from requirement 3a) and $107 per screen (the maximum transfer price the AD would be willing to pay). Any price in this range would be acceptable to both divisions for all of the SD’s output, and would also be optimal from Slate’s point of view. This would obviously apply to the “split the difference” price as well. When the SD has excess capacity, this rule would suggest a price of ($65 + $107)/2 = $86; for the other 70% of output that SD can sell externally, the rule indicates a price of ($92 + $107)/2 = $99.5. From a practical standpoint, note that the latter price also works when SD has excess capacity; as a result, the firm might prefer it as a stable benchmark price, keeping in mind of course that it credits SD with too high a profit even at times of unused capacity.
22-30 Effect of alternative transfer-pricing methods on division operating income.

1. Pounds of cranberries harvested 400,000
   Gallons of juice processed (500 gals per 1,000 lbs.) 200,000
   Revenues (200,000 gals. × $2.10 per gal.) $420,000
   Costs
   Harvesting Division
     Variable costs (400,000 lbs. × $0.10 per lb.) $ 40,000
     Fixed costs (400,000 lbs. × $0.25 per lb.) 100,000
     Total Harvesting Division costs 140,000
   Processing Division
     Variable costs (200,000 gals. × $0.20 per gal.) $ 40,000
     Fixed costs (200,000 gals. × $0.40 per gal.) 80,000
     Total Processing Division costs 120,000
     Total costs 260,000
     Operating income $160,000

2. 200% of Full Costs  Market Price
    Transfer price per pound (($0.10 + $0.25) × 2; $0.60) $0.70  $0.60

1. Harvesting Division
   Revenues (400,000 lbs. × $0.70; $0.60) $280,000  $240,000
   Costs
     Division variable costs (400,000 lbs. × $0.10 per lb.) 40,000  40,000
     Division fixed costs (400,000 lbs. × $0.25 per lb.) 100,000  100,000
     Total division costs 140,000  140,000
   Division operating income $140,000  $100,000
   Harvesting Division manager's bonus (5% of operating income) $7,000  $5,000

2. Processing Division
   Revenues (200,000 gals. × $2.10 per gal.) $420,000  $420,000
   Costs
     Transferred-in costs 280,000  240,000
     Division variable costs (200,000 gals. × $0.20 per gal.) 40,000  40,000
     Division fixed costs (200,000 gals. × $0.40 per gal.) 80,000  80,000
     Total division costs 400,000  360,000
   Division operating income $ 20,000  $ 60,000
   Processing Division manager’s bonus (5% of operating income) $ 1,000  $ 3,000
3. Bonus paid to division managers at 5% of division operating income is computed above and summarized below:

<table>
<thead>
<tr>
<th></th>
<th>Internal Transfers at 200% of Full Costs</th>
<th>Internal Transfers at Market Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvesting Division manager’s bonus</td>
<td>$7,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>(5% × $140,000; 5% × $100,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processing Division manager’s bonus</td>
<td>$1,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>(5% × $20,000; 5% × $60,000)</td>
<td></td>
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</tr>
</tbody>
</table>

The Harvesting Division manager will prefer to transfer at 200% of full costs because this method gives a higher bonus. The Processing Division manager will prefer transfer at market price for its higher resulting bonus.

Crango may resolve or reduce transfer pricing conflicts by:

- Basing division managers’ bonuses on overall Crango profits in addition to division operating income. This will motivate each manager to consider what is best for Crango overall and not be concerned with the transfer price alone.
- Letting the two divisions negotiate the transfer price between themselves. However, this may result in constant re-negotiation between the two managers each accounting period.
- Using dual transfer prices However, a cost-based transfer price will not motivate cost control by the Harvesting Division manager. It will also insulate that division from the discipline of market prices.
22-32 Multinational transfer pricing, global tax minimization.

This is a two-country two-division transfer-pricing problem with two alternative transfer-pricing methods.

Summary data in U.S. dollars are:

**South Africa Mining Division**
Variable costs: 600 ZAR ÷ 6 = $100 per lb. of raw diamonds
Fixed costs: 1,200 ZAR ÷ 6 = $200 per lb. of raw diamonds
Market price: 3,600 ZAR ÷ 6 = $600 per lb. of raw diamonds

**U.S. Processing Division**
Variable costs = $220 per lb. of polished industrial diamonds
Fixed costs = $850 per lb. of polished industrial diamonds
Market price = $3,500 per lb. of polished industrial diamonds

1. The transfer prices are:
   a. **250% of full costs**
      Mining Division to Processing Division
      = 2.5 × ($100 + $200) = $750 per lb. of raw diamonds
   b. **Market price**
      Mining Division to Processing Division
      = $600 per lb. of raw diamonds

<table>
<thead>
<tr>
<th></th>
<th>South Africa Mining Division</th>
<th>U.S. Processing Division</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Division revenues</strong></td>
<td>$6,000,000</td>
<td>$14,000,000</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division variable costs</td>
<td>800,000</td>
<td>880,000</td>
</tr>
<tr>
<td>Division fixed costs</td>
<td>1,600,000</td>
<td>3,400,000</td>
</tr>
<tr>
<td>Total division costs</td>
<td>2,400,000</td>
<td>10,280,000</td>
</tr>
<tr>
<td><strong>Division operating income</strong></td>
<td>$3,600,000</td>
<td>$3,720,000</td>
</tr>
</tbody>
</table>

25% of Full Cost | Market Price

**Full Cost** | **Market Price**

$6,000,000 | $4,800,000

$14,000,000 | $14,000,000

$4,920,000

22-8
2.

<table>
<thead>
<tr>
<th>Division</th>
<th>250% of Full Cost</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa Mining Division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division operating income</td>
<td>$3,600,000</td>
<td>$2,400,000</td>
</tr>
<tr>
<td>Income tax at 25%</td>
<td>900,000</td>
<td>600,000</td>
</tr>
<tr>
<td>Division after-tax operating income</td>
<td>$2,700,000</td>
<td>$1,800,000</td>
</tr>
<tr>
<td>U.S. Processing Division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division operating income</td>
<td>$3,720,000</td>
<td>$4,920,000</td>
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<tr>
<td>Income tax at 40%</td>
<td>1,488,000</td>
<td>1,968,000</td>
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<tr>
<td>Division after-tax operating income</td>
<td>$2,232,000</td>
<td>$2,952,000</td>
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</table>

3.

<table>
<thead>
<tr>
<th>Division</th>
<th>250% of Full Cost</th>
<th>Market Price</th>
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<tbody>
<tr>
<td>South Africa Mining Division:</td>
<td></td>
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<tr>
<td>After-tax operating income</td>
<td>$2,700,000</td>
<td>$1,800,000</td>
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<tr>
<td>U.S. Processing Division:</td>
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<td></td>
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<tr>
<td>After-tax operating income</td>
<td>2,232,000</td>
<td>2,952,000</td>
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<tr>
<td>Industrial Diamonds:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After-tax operating income</td>
<td>$4,932,000</td>
<td>$4,752,000</td>
</tr>
</tbody>
</table>

The South Africa Mining Division manager will prefer the higher transfer price of 250% of full cost and the U.S. Processing Division manager will prefer the lower transfer price equal to market price. Industrial Diamonds will maximize companywide net income by using the 250% of full cost transfer-pricing method. This method sources more of the total income in South Africa, the country with the lower income tax rate.

4. Factors that executives consider important in transfer pricing decisions include:
   a. Performance evaluation
   b. Management motivation
   c. Pricing and product emphasis
   d. External market recognition

Factors specifically related to multinational transfer pricing include:
   a. Overall income of the company
   b. Income or dividend repatriation restrictions
   c. Competitive position of subsidiaries in their respective markets