Chapter 6

The Theory of Tariffs and Quotas
Chapter Objectives

- Introduce the theory of tariffs
- Discuss the welfare and efficiency effects of tariffs
- Analyze the distinction between tariffs and quotas
In general, tariffs have been negotiated down to very low levels by the GATT/WTO members

- For industrial countries the current average tariff is about 4%.
- This obscures quite high tariffs, and quantitative restrictions on a number of goods: textiles and apparel; and agricultural goods.
- In addition, protection via various administered mechanisms takes the form of tariffs.
- Many developing countries have a comparative advantage in these areas and would benefit from tariff reductions.

Developing countries are characterized by considerably higher levels of protection.
On Tariffs, 1

- Generically, a tariff is a tax on imported goods.
  - Specific tariffs: $P_j = P_j^* + t_j^s$
  - Ad valorem tariffs: $P_j = P_j^* (1 + t_j^a)$
  - Compound/mixed tariff: $P_j = P_j^* (1 + t_j^a) + t_j^s$

- In the U.S., rates of duty are, since 1988, found in the *Harmonized Tariff Schedule of the US Annotated* (HTSA).
  - This document has its roots in the Tariff Act of 1930 as amended by the Tariff Classification Act of 1962.
On Tariffs, 2

- The HTS provides a classification of goods:
  - Each good has a six digit harmonized code and two additional digits (+ stat. suffix) specified by the US.
  - 5,000 subheadings, 1,241 headings, in 96 chapters, 21 sections.

- The HTS provides three rates of duty:
  - Column 2: Statutory rate [Cuba, Laos, North Korea];
  - Column 1 (General): The *MFN rate*; and
  - Column 1 (Special): Part IV, free trade areas, etc.
On Tariffs, 3

Programs under which special tariff treatment may be provided, and the corresponding symbols for such programs as they are indicated in the "Special" subcolumn, are as follows:

- Generalized System of Preferences .................. A, A* or A+
- Automotive Products Trade Act .......................... B
- Agreement on Trade in Civil Aircraft ................... C
- North American Free Trade Agreement:
  - Goods of Canada, under the terms of general note 12 to this schedule .................. CA
  - Goods of Mexico, under the terms of general note 12 to this schedule .................. MX
- African Growth and Opportunity Act .................. D
- Caribbean Basin Economic Recovery Act ................ E or E*
- United States-Israel Free Trade Area .................. IL
- Andean Trade Preference Act ............................ J or J*
- United States-Jordan Free Trade Area Implementation Act ................. JO
- Agreement on Trade in Pharmaceutical Products .......... K
- Uruguay Round Concessions on Intermediate
  - Chemicals for Dyes ........................................ L
- United States-Caribbean Basin Trade Partnership Act ........ R
<table>
<thead>
<tr>
<th>Heading/Subheading</th>
<th>Stat. Suffix</th>
<th>Article Description</th>
<th>Unit of Quantity</th>
<th>Rates of Duty 1</th>
<th>Rate of Duty 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Typewriters other than printers of heading 8471; word processing machines:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8469</td>
<td>00</td>
<td>Automatic typewriters and word processing machines:</td>
<td></td>
<td>Free</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>00</td>
<td>Word processing machines</td>
<td>No.</td>
<td>Free</td>
<td></td>
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<tr>
<td>8469</td>
<td>20.00</td>
<td>Other typewriters, electric</td>
<td>Free</td>
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<tr>
<td></td>
<td></td>
<td>Weighing not more than 12 kg, excluding case</td>
<td>No.</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30.00</td>
<td>Other typewriters, nonelectric</td>
<td>Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weighing not more than 12 kg, excluding case</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8470</td>
<td>00</td>
<td>Calculating machines and pocket-size data recording, reproducing and displaying machines with calculating functions: accounting machines, postage-franking machines, ticket-issuing machines and similar machines, incorporating a calculating device; cash registers:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.00</td>
<td>Electronic calculators capable of operation without an external source of electric power and pocket-size data recording, reproducing and displaying machines with calculating functions</td>
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<td>35%</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Display only</td>
<td>No.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Other</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.00</td>
<td>Other electronic calculating machines:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incorporating a printing device</td>
<td>No.</td>
<td>Free</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>No.</td>
<td>Free</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other calculating machines</td>
<td>No.</td>
<td>Free</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>30.00</td>
<td>Accounting machines</td>
<td>No.</td>
<td>Free</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>40.00</td>
<td>Cash registers</td>
<td>No.</td>
<td>Free</td>
<td>35%</td>
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<tr>
<td></td>
<td></td>
<td>Point-of-sale terminals</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50.00</td>
<td>Postage-franking machines</td>
<td>No.</td>
<td>Free</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>90.00</td>
<td>Postage-franking machines</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heading/Subheading</td>
<td>Article Description</td>
<td>Unit of Quantity</td>
<td>Rates of Duty</td>
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<td>--------------------</td>
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</tr>
<tr>
<td>6204 (con.)</td>
<td>Women's or girls' suits, ensembles, suit-type jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear) (con.): Suit-type jackets and blazers (con.) Of cotton: Containing 36 percent or more by weight of flax fibers (335)</td>
<td>doz. 2.8%</td>
<td>Free (CA, IL, JO, MX) 35%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6204.32.10 00</td>
<td>Other</td>
<td>kg 9.5%</td>
<td>Free (CA, IL, MX) 90%</td>
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<td></td>
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<tr>
<td>6204.32.20</td>
<td>Other: Corduroy: Women's (335)</td>
<td>doz.</td>
<td>4.8% (JO) 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Girls' (335)</td>
<td>kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other: Women's (335)</td>
<td>doz.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Girls' (335)</td>
<td>kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6204.33.10 00</td>
<td>Of synthetic fibers: Containing 30 percent or more by weight of silk or silk waste (635)</td>
<td>doz. 7.2%</td>
<td>Free (CA, IL, MX) 65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6204.33.20 00</td>
<td>Containing 36 percent or more by weight of flax fibers (635)</td>
<td>doz. 2.8%</td>
<td>Free (CA, IL, JO, MX) 35%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6204.33.40</td>
<td>Containing 36 percent or more by weight of wool or fine animal hair</td>
<td>kg 46.3¢/kg + 21%</td>
<td>Free (CA, IL) 46.3¢/kg + 37¢/kg + 16.8% (JO) 58.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Women's (435)</td>
<td>doz.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Girls' (435)</td>
<td>doz.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
On Tariffs, 6

- Other tricky issues in implementing tariff policy:
  - *Customs classification*: in which commodity classification does the good fall?
  - *Tariff valuation*: what is the price of the good against which the tariff is applied?
  - *Country of origin*: from what country does the good come for customs purposes?
Economic Analysis of Tariffs, 1

- Tariffs interfere with market determination of prices.
  - The tariff directly affects the choices of both producers and consumers.
  - If the market is undistorted, the introduction of the tariff constitutes a distortion and will reduce the efficiency of the market.
  - If the market is distorted, a tariff might make the economy more efficient, but it can also make the economy less efficient.
Our analysis of the tariff will apply *partial equilibrium* methods. That is,

- We will consider the effect of the tariff on a single industry, in isolation from the rest of the economy.
- We assume that prices of all other goods and factors of production are unaffected by the change in this good’s trade policy.
- While highly doubtful as a statement of economic reality, partial equilibrium methods have proved very useful in developing an understanding of trade policy.
Two useful distinctions in our analysis:

- **Positive v. Normative**
  - The positive analysis of the tariff considers how the tariff affects equilibrium outcomes; while
  - The normative analysis of the tariff tries to draw conclusions about whether the policy is good or bad.

- **Small country v. large country**
  - The policies of a small country have no affect on world prices; while
  - The policies of a large country affect world prices.
Economic Analysis of Tariffs, 4: Small Country, Autarky

Under autarky, equilibrium price and quantity are determined where supply = demand.
Under free trade, the small country faces fixed world prices. At these lower prices:

1) Home demand rises; and
2) Home supply falls.
3) Yielding imports of

\[ M = D - S \]
A specific tariff raises the domestic price to $P = P^W + t$.

1) Home demand falls; and
2) Home supply rises.

3) Yielding imports of $M' = D' - S'$
Economic Analysis of Tariffs, 4: Small Country, Welfare Effects a
Economic Analysis of Tariffs, 4: Small Country, Welfare Effects

1) **Redistribution**
   a) Increase in producer surplus;
   b) Increase government revenue; and

2) **Deadweight Loss**
   In:
   a) Consumption;
   b) Production.
Without making explicit welfare judgments, we cannot say anything about the redistributions:
- From consumers to producers; and
- From consumers to government, but

We can say that, since no one gets any benefit from the deadweight losses, a tariff must lower welfare relative to free trade for the small economy.
Somewhat more speculative effects of protection:

- Liberal trade is associated with more rapid adoption of innovation, so protection may reduce rates of growth;
- International competition tends to discipline imperfectly competitive practices, so protection may support distortions deriving from those practices; and
- Protection in one country may induce retaliation in another.

This last is a *large country* issue.
The key to analyzing the large country case is the recognition that, instead of being horizontal, the world supply curve for the good is upward sloping.

This means that when a tariff is imposed,

- In addition to restricting supply,
- The foreign country reduces the price on all the infra-marginal units supplied.
The Large Country Analysis of a Tariff, 2: Deriving the $E_D$ Curve
The Large Country Analysis of a Tariff, 3: The $E_S$ Curve and Eq.
The Large Country Analysis of a Tariff, 4: Imposition of a tariff
The Large Country Analysis of a Tariff, 5: Welfare Effects

Loss of consumer surplus
The Large Country Analysis of a Tariff, 6: Welfare Effects

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Deadweight loss
Government revenue

$P$

$S$

$D$

$Q$

$E_D$

$E_S^*$
The Large Country Analysis of a Tariff, 7: Welfare Effects

Note: Now Foreign “pays” part of the tariff
The preceding analysis showed that, for the large country, there are both losses (the deadweight losses) and gains (the terms-of-trade effect).

This suggests that there is a tariff that yields the maximum gain net of deadweight loss.

The tariff that does this is called the **optimal tariff**.
The Large Country Analysis of a Tariff, 8: The “Optimal” Tariff, $b$

Free trade:
Consumer surplus maximized; no terms-of-trade gain.
The Large Country Analysis of a Tariff, 8: The “Optimal” Tariff, c

Prohibitive Tariff
Consumer surplus minimized; no terms-of-trade gain.
The optimal tariff will lie between free trade and the prohibitive tariff.

- This is the tariff such that the marginal gain due to terms-of-trade improvement from increasing the tariff is just equal to the marginal increase in deadweight loss.

- This is easy enough to calculate in the one or two good case, but

- In an environment with many goods, the *optimal tariff schedule* is prohibitively difficult to calculate.
Economy-Wide Effects of a Tariff: Positive Effects

- **Retaliation**
  - Even if the Foreign country does not respond to the Home tariff with an export subsidy, it might well put a tariff on some Home country exports.
  - This reduces the economic gain from the tariff.

- **Income redistribution**
  - In addition to the redistribution from consumers to producers and government;
  - The Stolper-Samuelson theorem reminds us that there is redistribution among factors of production.
We cannot draw normative conclusions without an objective function. We have already noted that, with non-economic objectives, a tariff may be welfare-improving even for a small country.

Given the certain presence of redistributive effects:
- All we can ensure from liberalization is a potential Pareto improvement.
- To guarantee an actual Pareto improvement, there must be explicit income redistribution.
- Note that a government may have a redistributive objective.
To this point, we have assumed that every good is produced entirely from factors of production. However, virtually all goods are produced from factors of production and \textit{intermediate goods}.

- The intermediate goods, like factors of production, must be purchased in the market.

In this case, even if we assume that factors are internationally immobile, we must be concerned with the effect of the tariff-schedule on \textit{value-added} in the industry.
Value-added refers to the value produced by factors of production in transforming intermediate products into a new product.

If we let $a_{ij}$ refer to the input of intermediate good $i$ in one unit of good $j$, we can define value added, under free trade in $j$ ($V_j^F$), as:

$$V_j^F = p_j - \sum_{i \in J} a_{ij} p_i.$$

Note that the summation is over $J$, i.e. commodities, not $I$, i.e. factors of production.
The nominal rate of, *ad valorem*, protection is just the proportional increase in the *price* caused by the tariff:

\[ P_j = P_j^* (1 + t_j) \Rightarrow t_j = \frac{P_j - P_j^*}{P_j^*}; \]

The *effective rate of protection* is the proportional increase in value-added induced by the tariff structure \((V_j^P)\):

\[ e_j = \frac{V_j^P - V_j^F}{V_j^F}. \]
Consider an example: for concreteness consider the case of a good (laptops), which uses a single importable input (memory chips).
## Effective Rate of Protection: 5

<table>
<thead>
<tr>
<th></th>
<th>Free Trade</th>
<th>$t_L = 20%$ $t_M = 0%$</th>
<th>$t_L = 20%$ $t_M = 50%$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price of laptop computer</td>
<td>$1000$</td>
<td>$1200$</td>
<td>$1200$</td>
</tr>
<tr>
<td>Cost of memory chips</td>
<td>$600$</td>
<td>$600$</td>
<td>$900$</td>
</tr>
<tr>
<td>Domestic value added</td>
<td>$400$</td>
<td>$600$</td>
<td>$300$</td>
</tr>
<tr>
<td>Effective rate of protection</td>
<td>0%</td>
<td>50%</td>
<td>-25%</td>
</tr>
</tbody>
</table>
Note that value added with protection is:

\[ V^p = p_j \left(1 + t_j\right) - \sum_{i \in J} a_{ij} p_i \left(1 + t_i\right). \]

Substituting for \( V_j^F \) and \( V_j^P \) in our definition of effective rate of protection, we can get:

\[
e_j = t_j + \sum_{i \in J} \left(t_j - t_i\right) \frac{P_i a_{ij}}{V_j^F} = t_j + \frac{1}{V_j^F} \sum_{i \in J} \left(t_j - t_i\right) P_i a_{ij}.
\]
Thus, the effective rate is equal to the nominal rate if:

- There are no inputs, i.e. \( a_{ij} = 0 \) \( \forall i \in J \);
- There is a uniform tariff, i.e. \( t_i = t_j \) \( \forall i \in J \);
- The gap between nominal and effective rates is greater the more important are intermediate goods in the production of the final good: ie. the larger is \( \sum P_i a_{ij} \) relative to \( V_j^F \).
Comparing nominal and effective rates:
- If the tariff rate on final goods exceeds the value-weighted share of the tariff on intermediates, $e_j > t_j$; and
- If the tariff rate on final goods is less than the value-weighted share of the tariff on intermediates, $e_j < t_j$.

**Tariff escalation**, the value chain and LDC exports
- Industrial country tariff schedules generally have rates which increase with processing up to a fairly high level and fall again (the *tariff hump*);
- This implies that effective rates exceed nominal rates on goods intermediate in the value chain.
- But these are precisely the goods of most interest to export-oriented developing countries.
<table>
<thead>
<tr>
<th>Product Group</th>
<th>United States</th>
<th>European Community</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nominal</td>
<td>Effective</td>
<td>Nominal</td>
</tr>
<tr>
<td>Food, beverages, and tobacco</td>
<td>4.7</td>
<td>10.2</td>
<td>10.2</td>
</tr>
<tr>
<td>Textiles</td>
<td>9.2</td>
<td>18.0</td>
<td>7.2</td>
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<tr>
<td>Apparel</td>
<td>22.7</td>
<td>43.3</td>
<td>2.0</td>
</tr>
<tr>
<td>Leather products</td>
<td>4.2</td>
<td>5.0</td>
<td>11.6</td>
</tr>
<tr>
<td>Footwear</td>
<td>8.8</td>
<td>15.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Wood products</td>
<td>1.7</td>
<td>1.7</td>
<td>5.6</td>
</tr>
<tr>
<td>Furniture and fixtures</td>
<td>4.1</td>
<td>5.5</td>
<td>5.4</td>
</tr>
<tr>
<td>Paper and paper products</td>
<td>0.2</td>
<td>-0.9</td>
<td>2.1</td>
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<tr>
<td>Printing and publishing</td>
<td>0.7</td>
<td>0.9</td>
<td>8.0</td>
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<td>Chemicals</td>
<td>2.4</td>
<td>3.7</td>
<td>1.2</td>
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<td>Petroleum and petroleum products</td>
<td>1.4</td>
<td>4.7</td>
<td>1.2</td>
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<td>Rubber products</td>
<td>2.5</td>
<td>2.0</td>
<td>3.5</td>
</tr>
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<td>Nonmetallic mineral products</td>
<td>5.3</td>
<td>9.2</td>
<td>3.7</td>
</tr>
<tr>
<td>Glass and glass products</td>
<td>6.2</td>
<td>9.8</td>
<td>7.7</td>
</tr>
<tr>
<td>Iron and steel</td>
<td>3.6</td>
<td>6.2</td>
<td>4.7</td>
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<tr>
<td>Nonferrous metals</td>
<td>0.7</td>
<td>0.5</td>
<td>2.1</td>
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<td>Metal products</td>
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<td>7.9</td>
<td>5.5</td>
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<td>Nonelectrical machinery</td>
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<td>4.1</td>
<td>4.4</td>
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<td>6.3</td>
<td>7.9</td>
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<td>Transport equipment</td>
<td>2.5</td>
<td>1.9</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Where a tariff is a tax on imports, a *quota* (or *quantitative restriction*) fixes the quantity that may be imported.

The economic analysis of the quota proceeds in exactly the same way as the analysis of a tariff.

We will consider only the small country case, since the large country case is a simple extension of the work we have already done.
From initial imports of $M$, a quota restricts imports to $M'$.
This causes the domestic price to rise to $P_Q$. 
Economic Analysis of Quotas, 3

Loss in Consumer Surplus

\[ P \]

\[ P_Q \]

\[ P_W \]

\[ S \]

\[ S' \]

\[ D' \]

\[ D \]

\[ Q \]

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Economic Analysis of Quotas, 4

1) **Redistribution**
   a) Increase in consumer surplus;
   b) Quota rent,

2) **Deadweight Loss** In:
   a) Consumption;
   b) Production.
A fundamental difference between tariffs and quotas has to do with the *quota rent*.

- Quota schemes are implemented by issuing rights to import, usually called *import licenses*.
- The quota rent is a *rent* because the value of the import license is zero, except as a component of an import restriction scheme.
- That is, whoever possesses the import license has a right to the difference between the landed price of the import, $P^w$, and the domestic price with the quota, $P^Q$. 
This analysis should look a lot like the tariff

Under the competitive assumptions maintained in the tariff case, using our partial equilibrium analysis, there is an equivalence between the tariff and the quota;

\[ P^Q = P^W + t; \]
\[ S^t = S^q, \quad D^t = D^q; \quad \text{so} \quad M^t = Q. \]

As long as the quota rights are allocated among competitive domestic agents, the welfare implications are the same.
Allocating quota rights: who gets the rent?

- **Auction**: if the auction is appropriately constructed, the import rights will go to those who value those rights most, and the government will get the rent. Just like the tariff.

- **Allocation to citizens**: instead of redistributing from consumers to government, the redistribution occurs to some other group of citizens, e.g.:
  - Allocation to importers;
  - Allocation to competing firms;
  - Allocation to political friends.
Voluntary Export Restraints, 1

- **Voluntary Export Restraints**
  - In this case, the quota is administered by the *Foreign* government.
  - That is, VERs give Foreign governments the right to collect taxes from Home citizens.
  - Thus, the quota rents must now be subtracted from national welfare along with the deadweight losses.
  - This raises the cost of VERs considerably relative to other forms of protection.
Voluntary Export Restraints, 2

- How costly is the rent transfer?
  - *Machine tools* (1989-90): VER estimated to have a DWL of $35 million, but a rent transfer of $350 million;
  - *Automobile VER* (1981-85): VER estimated to have a DWL of $200 million, but a rent transfer of $2.2 billion.
  - *Textile and Apparel* protection under the MFA is estimated to have a DWL of $2.5 billion, but a rent transfer of $8.6 billion.
So why are there VERs?

- Until the Uruguay Round, they were GATT-Legal
- Exporters like them better than other forms of protection, and
- Especially under imperfect competition, VERs may raise profits above the levels available without them.
- Domestically, they are sufficiently obscure that politicians may like them (e.g. Reagan and the auto VER)
Tariffs versus Quotas

- Tariffs maintain an automatic link between domestic and foreign prices, this link is severed with quotas.
- Tariffs are more transparent: it is easier to calculate the costs of a tariff.
- Tariffs are generally applied in a non-discriminatory fashion, it is much harder to do this with quotas.
- Tariffs generate government revenue, quotas (except for the auction case) generate private revenue, which creates a strong incentive for corruption.
- Thus, most economists prefer tariffs to quotas as an instrument of protection—*if there must be protection.*
Table 1
Annual Cost of U.S. Import Protection
(billion dollars, years around 1985)

<table>
<thead>
<tr>
<th></th>
<th>U.S. Deadweight Loss (B + D)</th>
<th>Quota Rents (C or C + E)</th>
<th>Foreign Deadweight Loss (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobiles</td>
<td>0.2–1.2&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>2.2–7.9&lt;sup&gt;a,c&lt;/sup&gt;</td>
<td>0–3&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Dairy</td>
<td>1.4&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.25&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.02&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Steel</td>
<td>0.1–0.3&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>0.7–2&lt;sup&gt;a,c&lt;/sup&gt;</td>
<td>0.1&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sugar</td>
<td>0.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.4–1.3&lt;sup&gt;c,g&lt;/sup&gt;</td>
<td>0.2&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td>Textiles &amp; Apparel</td>
<td>4.9–5.9&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>4.0–6.1&lt;sup&gt;a,c&lt;/sup&gt;</td>
<td>4–15.5&lt;sup&gt;h&lt;/sup&gt;</td>
</tr>
<tr>
<td>Average Tariffs</td>
<td>1.2 – 3.4&lt;sup&gt;i&lt;/sup&gt;</td>
<td>0</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Total</strong>*</td>
<td>7.9–12.3</td>
<td>7.3–17.3</td>
<td>4.3–18.8</td>
</tr>
</tbody>
</table>

*In dairy the quota rents are earned by U.S. importers, and so are not included in the total.

n.a.—not available

Sources:
- a de Melo and Tarr (1990)
- b Hufbauer, Berliner and Elliott (1986)
- c Bergsten et al (1987, Table 3.3)
- d Feenstra (1988)
- e Anderson (1985)
- f Boorstein (1987)
- g Leu, Schmitz and Knutson (1987)
- i Rousslang and Tokarick (1991)
The Costs of Protection – United States and Japan

- Before the Uruguay Round tariff cuts, 21 industries accounted for 50% of the total cost of formal protection to U.S. consumers
  - In 1990, the total reduction in consumer surplus as a result of tariffs was $64 billion, or 1.3% of U.S. GDP
- In Japan, 46 industries accounted for 50% of the total cost of all protection cost to Japanese consumers
  - In 1989, the total reduction in consumer surplus as a result of tariffs and non-tariff barriers was between $75 billion and $110 billion, or 2.6%–3.8% of Japanese GDP
### Table 7.1: Japanese and American Protection (Millions of Dollars)

<table>
<thead>
<tr>
<th></th>
<th>Producer Surplus Gained</th>
<th>Tariff Revenue</th>
<th>Quota Rents</th>
<th>Efficiency and Consumption Deadweight Losses</th>
<th>National Welfare Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Japan (1989)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and beverages (17)</td>
<td>43,210</td>
<td>1,086</td>
<td>6,909</td>
<td>7,189</td>
<td>14,098</td>
</tr>
<tr>
<td>Textiles and light industry (6)</td>
<td>3,341</td>
<td>812</td>
<td>3,059</td>
<td>1,767</td>
<td>4,826</td>
</tr>
<tr>
<td>Metals (7)</td>
<td>2,546</td>
<td>77</td>
<td>2,185</td>
<td>354</td>
<td>2,539</td>
</tr>
<tr>
<td>Chemical products (11)</td>
<td>8,466</td>
<td>135</td>
<td>3,866</td>
<td>3,033</td>
<td>6,899</td>
</tr>
<tr>
<td>Machinery (6)</td>
<td>12,286</td>
<td>25</td>
<td>4,233</td>
<td>5,043</td>
<td>9,276</td>
</tr>
<tr>
<td><strong>Total, Japan</strong></td>
<td>69,849</td>
<td>2,135</td>
<td>20,252</td>
<td>17,386</td>
<td>37,638</td>
</tr>
<tr>
<td><strong>United States (1990)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and beverages (5)</td>
<td>1,775</td>
<td>176</td>
<td>646</td>
<td>350</td>
<td>996</td>
</tr>
<tr>
<td>Textiles and light industry (9)</td>
<td>12,242</td>
<td>5,403</td>
<td>6,124</td>
<td>2,574</td>
<td>8,698</td>
</tr>
<tr>
<td>Chemical products (2)</td>
<td>222</td>
<td>232</td>
<td>0</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Machinery (1)</td>
<td>157</td>
<td>0</td>
<td>350</td>
<td>35</td>
<td>385</td>
</tr>
<tr>
<td>Miscellaneous (2)</td>
<td>1,288</td>
<td>50</td>
<td>0</td>
<td>557</td>
<td>557</td>
</tr>
<tr>
<td><strong>Total, United States</strong></td>
<td>15,684</td>
<td>5,861</td>
<td>7,120</td>
<td>3,546</td>
<td>10,666</td>
</tr>
</tbody>
</table>

Before Uruguay Round cuts, the national losses to Japan and the United States were approximately $37.6 billion and $21.4 billion, respectively.

*Notes:* The numbers in parentheses are the number of industries with high levels of protection included in each category. The Japanese totals make up the majority of total protection in Japan, while the U.S. figures include the twenty-one industries comprising about one-half the total protection in the United States. The sources are Sossana, Urata, and Kawai, *Measuring the Costs of Protection in Japan*; and Heitbauer and Elliott, *Measuring the Costs of Protection in the United States*. 

*Slide 6-55*
The Costs of Protection: Empirical Estimates, 2

- Note that the redistributive gain to producers is some several times as large as the deadweight loss.

- Note that, as a percentage of national income, the deadweight losses are tiny ($3.5/$5803 billion).
  - Including rent transfers ($10.4/$5803 billion).

- Note that this table does not show, though the studies from which they are derived present such results, the *terms-of-trade* effects of protection.
  - Taking these into effect reduces the net welfare effect by about $1.5 billion.
Protection is a very regressive tax

- Given the structure of protection, and the allocation of income to consumption by various income groups, the clothing, sugar and automobile trade restraints alone yield:
  - 23% income surcharge on the lowest income groups; and
  - 3% income tax on people earning above $60,000.
<table>
<thead>
<tr>
<th>Product</th>
<th>Value of 2001 Imports</th>
<th>Tariff Revenue</th>
<th>Average Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>All goods</td>
<td>$1,132.6</td>
<td>$18.6</td>
<td>1.6%</td>
</tr>
<tr>
<td>Shoes &amp; clothes</td>
<td>$76.3</td>
<td>$8.7</td>
<td>11.4%</td>
</tr>
<tr>
<td>Other high-tariff consumer goods</td>
<td>$21.6</td>
<td>$1.6</td>
<td>8.4%</td>
</tr>
<tr>
<td>Everything else</td>
<td>$1,038.7</td>
<td>$8.4</td>
<td>0.8%</td>
</tr>
</tbody>
</table>


1 in billions of dollars and as a percentage of the value of all imports
2 in billions of dollars and as a percentage of all tariff revenue
<table>
<thead>
<tr>
<th>Country</th>
<th>Per Capita GDP</th>
<th>2001 Exports to U.S. in billions</th>
<th>Tariffs Paid in millions</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepal</td>
<td>$240</td>
<td>$0.20</td>
<td>$25</td>
<td>12.3%</td>
</tr>
<tr>
<td>Ireland</td>
<td>$22,660</td>
<td>$18.60</td>
<td>$29</td>
<td>0.2%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>$370</td>
<td>$2.35</td>
<td>$331</td>
<td>14.1%</td>
</tr>
<tr>
<td>France</td>
<td>$24,170</td>
<td>$30.02</td>
<td>$330</td>
<td>1.1%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>$260</td>
<td>$0.96</td>
<td>$152</td>
<td>15.8%</td>
</tr>
<tr>
<td>Singapore</td>
<td>$30,170</td>
<td>$14.90</td>
<td>$96</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

Sources: World Bank, *World Development Indicators 2002*; ITC dataweb.
Other forms of protection

- Tariffs and quotas do not exhaust the forms of protection
  - While the various forms of *administered protection* ultimately yield tariffs or quotas of some kind, the process itself is costly in terms of both real resources and uncertainty.
  - Various aspects of *customs treatment* can be applied in ways that are protective.
  - Various *domestic regulatory policies* can be applied in ways that discriminate against imported goods.
The notion of subsidizing exports is quite popular with trade activists.

On the other hand, export subsidies are technically illegal under the GATT (i.e. they may be countervailed under Article VI).

Direct export subsidies are not uncommon in agriculture
- the US grants direct cash payments per unit of export.
- Such schemes are a fundamental part of the ECs CAP.

Even more common are indirect subsidies such as the provision of subsidized export credits.
At free trade prices above the autarky price the country is an exporter—\( X = (S - D) \)

An export subsidy raises the price received by exporters

Producers increase output,
This raises price to Home consumers who reduce demand

Exports rise from \((S - D)\) to \((S' - D')\)
In addition, consumer surplus falls. Producer surplus rises, so income is redistributed from taxpayers to producers, but Tax revenues must be raised to pay for the subsidy, so There are still DWLs, in production and consumption.

In addition, consumer surplus falls.
Because revenues must be raised to pay for them, export subsidies are an expensive policy even for a small-country.

The situation is worse for the large-country since an export subsidy induces a terms-of-trade loss.
It is common for economists to note that real resources are used in the pursuit of policies that:

- Increase profits; or
- Create rents.

Furthermore, once rents are created, real resource may be used to seek those rents.

It has been widely argued that, since these real resources could have been used to produce goods, those resources should be treated as lost and added to the welfare costs of protection.
This strikes me as, at least, incomplete (and maybe wrong).

Another word for that expenditure of resources is *democratic politics*.

- On the whole we tend to think democratic politics has positive value, so
- Until we develop a normative political-economic analysis that can weigh the positive values of democratic politics against lost resources, it would be premature to draw welfare conclusions of this sort.