

Lecture Notes for Grossman and Helpman's Protection for Sale

Andrés Rodríguez-Clare
Pennsylvania State University and NBER

April 26, 2007

Here I follow Feenstra, Chapter 9, and its notation.

Three steps: (1) economic structure, (2) political structure, (3) equilibrium tariffs.

1 Economic Structure

N goods and a numeraire commodity.

There are L individuals, indexed by h . Each owns a unit of labor.

Preferences are quasi-linear, so that individual h 's utility is

$$c_0^h + \sum_{i=1}^N u_i(c_i^h)$$

Here c_0^h is consumption of the numeraire good.

Maximization of utility subject to the budget constraint for each consumer (i.e., $I^h = \sum_i p_i c_i^h$) yields a demand function $d(p) = [d_1(p_1), \dots, d_N(p_N)]$.

Note that demand functions are identical across individuals - they differ only in their income levels I^h .

Also, note that there are no income effects here thanks to quasi-linear preferences - an increase in I^h would simply go towards buying more of the numeraire good.

Expenditure on goods 1 to N is $\sum_i p_i d_i(p_i)$. Thus,

$$c_0^h = I^H - \sum_{i=1}^N p_i d_i(p_i)$$

The individual indirect utility functions are then

$$V(p, I^h) = I^h - \sum_i p_i d_i(p_i) + \sum_i u_i [d_i(p_i)]$$

Letting

$$s(p) = \sum_i u_i [d_i(p_i)] - \sum_i p_i d_i(p_i)$$

then we can simply write

$$V(p, I^h) = I^h + s(p)$$

Turning to the production side, it is assumed that labor productivity in the numeraire good is one. This fixes the wage at one.

There is a specific factor in quantity K_i in each sector. Output in each sector is produced with this specific factor and labor, which is perfectly mobile across sectors. Output is then

$$y_i = f_i(L_i, K_i)$$

It is assumed that production functions have CRS. Profits are

$$\pi_i(p_i) = \text{Max}_{L_i} \{p_i f_i(L_i, K_i) - L_i\}$$

while supply functions are simply $y_i(p_i) = \pi'_i(p_i)$.

International prices are p_i^* , while domestic prices are $p_i = p_i^* + t_i$.

The economy is assumed to be "small," so p^* is exogenous.

Note that if a good is imported then t_i is a tariff (if negative then it is an import subsidy), while if the good is exported then t_i is an export subsidy (if negative then it is an export tax).

Imports are

$$m_i(p_i) = d_i(p_i)L - y_i(p_i)$$

This may be negative, in which case we have exports.

Trade balance is obtained through exports or imports of the numeraire good.

Tariff revenue is

$$T(p) = \sum_{i=1}^N (p_i - p_i^*) m_i(p_i)$$

This is given back to consumers in lump sum fashion (i.e., there are lump-sum transfers).

The specific factor in each industry i is owned by H_i people, and $H \equiv \sum_i H_i$.

Each person owns one unit of labor, hence $L - H$ people own no capital.

Owners of specific capital in sector i (together) have utility given by

$$W_i(p) = \pi_i(p_i) + H_i(1 + s(p)) + \frac{H_i}{L}T(p)$$

The remaining $L - H$ people have joint utility given by

$$W_0(p) = (L - H)(1 + s(p)) + \frac{L - H}{L}T(p)$$

Finally, aggregate welfare is

$$W(p) = \sum_{i=0}^N W_i(p)$$

2 Political structure

It is assumed that sectors $j \in J_O$ are organized into lobbies, while sectors $j \in J_U$ are not, while $J_O \cup J_U = \{1, \dots, N\}$.

The government cares about contributions and welfare.

Each lobby announces a campaigning contribution schedule $R_j(p)$, and then the government chooses p to maximize

$$G(p) = \sum_{j \in J_O} R_j(p) + \alpha W(p)$$

where α is the weight that the government places on social welfare relative to contributions.

3 Equilibrium tariffs

What is the set of equilibrium $R_j(p)$? Bernheim and Whinston show that the equilibrium set of contribution schedules includes the one called "truthful contribution schedules," which are

$$R_j(p) = \max\{0, W_j(p) - B_j\}$$

But then

$$G(p) = \sum_{j \in J_O} [(1 + \alpha)W_j(p) - B_j] + \alpha \sum_{j \notin J_O} W_j(p)$$

This shows that organized sectors have a weight $1 + \alpha$ whereas unorganized lobbies have a weight α .

Letting $\lambda_o = \sum_{j \in J_O} H_j / L$ denote the fraction of the population owning a specific factor in an organized industry, and $\delta_j = 1$ if $j \in J_O$ and zero otherwise, then the F.O.C. is

$$\frac{t_j}{p_j} = - \left[\frac{\delta_j - \lambda_o}{\alpha + \lambda_o} \right] \left(\frac{y_j}{m_j} \right) \left(\frac{\partial m_j}{\partial p_j} \frac{p_j}{m_j} \right)^{-1}$$

Note the following points:

- $t_j > 0$ if $j \in J_O$ and $t_j < 0$ otherwise - unorganized sectors are hit by an import subsidy or an export tax (as long as $\lambda_o > 0$, see below)
- If $\lambda_o = 1$ then there is no protection for organized sectors, but an export tax or import subsidy in unorganized sectors.

$$\frac{t_j}{p_j} = - \left[\frac{\delta_j - \lambda_o}{\alpha + \lambda_o} \right] \left(\frac{y_j}{m_j} \right) \left(\frac{\partial m_j}{\partial p_j} \frac{p_j}{m_j} \right)^{-1}$$

- If $\lambda_o = 0$ then there are no taxes or subsidies in unorganized sectors, but there is protection in organized sectors.
- For organized sectors, if λ_o declines then t_j/p_j increases.
- The last term is the import demand elasticity \rightarrow protection is lower in sectors with a higher import-demand elasticity.

$$\frac{t_j}{p_j} = - \left[\frac{\delta_j - \lambda_o}{\alpha + \lambda_o} \right] \left(\frac{y_j}{m_j} \right) \left(\frac{\partial m_j}{\partial p_j} \frac{p_j}{m_j} \right)^{-1}$$

- An increase in α implies less protection.
- A lower y_j/m_j (lower import penetration) implies less protection.

4 Evaluating the Model

- The prediction that for unorganized sectors there will be import subsidies or export taxes is obviously inconsistent.
- We can fix this by assuming that capital is very concentrated, i.e. $\lambda_o = 0$. In this case unorganized sectors have $t_j = 0$ and organized sectors have

$$\frac{t_j}{p_j} = - \left(\frac{1}{\alpha} \right) \left(\frac{y_j}{m_j} \right) \left(\frac{1}{e_j} \right)$$

- The role of α and e_j is obvious.
- The most important variable, namely whether the sector has a lobby or not, is exogenous.

- And the most interesting, non-obvious implication, namely that a higher y/m leads to higher protection in organized sectors, finds only weak support (at most) in empirical studies
 - Goldberg and Maggi find weak support (coefficient on y/m is positive but not statistically significant)
 - Trefler (1993, JPE) finds the opposite relation.

- One can "fix" the model by introducing the realistic assumption that a dollar in the government's hands is worth more to it than in the hands of the public (see Maggi and Rodríguez-Clare, JIE 2000)
- This could be because of raising public funds is distortionary.
- A simple way to introduce this is by assuming that tariff revenue is not distributed back to citizens, but used by the government for a project that gives the government a value of γ per dollar spent on it.
- The third terms in the expressions for $W_i(p)$ and $W_0(p)$ vanish, and now

$$G(p) = \sum_{j \in J_0} R_j(p) + \alpha W(p) + \gamma T(p)$$

- With $\lambda_o = 0$, the F.O.C. implies $\frac{t_j}{p_j} = \frac{(\alpha - \gamma)m(p_j) - y_j}{\gamma m'_j(p_j)p_j}$
- Letting $e_j^d = -d'_j(p_j)p_j/d_j(p_j)$ and $e_j^s = y'_j(p_j)p_j/y_j(p_j)$, and $z_j = y_j/Ld_j$, then

$$\frac{t_j}{p_j} = \frac{(\alpha - \gamma)(1 - z_j(p)) + z_j(p)}{\gamma (e_j^d(p_j) + e_j^s(p_j)z_j(p))}$$

- If $\gamma = 1 + \alpha$, so that the government values one dollar in its hands equally to one dollar of contributions, then

$$\frac{t_j}{p_j} = \frac{1}{\gamma (e_j^d(p_j) + e_j^s(p_j)z_j(p))}$$

- Clearly, a higher z_j implies a lower tariff.

- One puzzle that emerges from empirical studies with the GH model is that the implied α is *extremely* high: given reasonable elasticities, governments would have to be close to welfare maximizers for the observed levels of protection to be compatible with the model.
- A recent contribution in this regard is Gawande, Krishna and Olarreaga - "Lobbying Competition over Trade Policy." They show that competition between downstream and upstream industries cancel each other out and reduce protection levels even if governments care significantly about contributions.

- What determines whether a sector is organized or not?
- The most important factor is how to solve the "free rider problem."
- Presumably, declining sectors should have an easier time, because at least they avoid entry (Baldwin and Robert-Nicoud, 2007). This is consistent with the evidence.

- Presumably, it is easier to organize a lobby when the group is less numerous, more homogenous and less geographically dispersed (Mancur Olson).
 - This would explain why consumers are usually not organized, generating a bias for protection.
 - It could also explain why agriculture is more organized and protected in rich countries than poor countries.
- Bombardini's "Firm Heterogeneity and Lobby Participation" explore these ideas by modelling individual firms' incentives to make contributions.
 - She shows that, consistent with the data, sectors with higher firm-size dispersion obtain higher protection.

- The approach to how the private sector influences policy in GH is very crude: both lobbying and politics are much more complex.
 - Lobbies not only provide contributions, but information to politicians, and influence voters directly.
 - In reality there is no unified government that cares about contributions and sets policy... there is competition among parties and politicians. This is affected by voting and the structure of democratic institutions.
- Grossman and Helpman explore these themes in their book *Special Interest Politics*

- We have ignored a very important conceptual matter: why is it that politicians use distortionary trade policy to transfer resources to organized producers, rather than direct transfers or (second best) production subsidies? (see Rodrik's Handbook paper)
 - Tariffs as a means of reducing costly redistribution (Rodrik, 1986, Wilson, 1990, Grossman and Helpman, 1994)
 - Tariffs as informationally efficient policies (Coate and Morris, 1995, and Feenstra and Lewis, 1991)