Homework #8

1. “For a small country like the Philippines, a move to free trade would have huge advantages. It would let consumers and producers make their choices based on the real costs of goods, not on artificial prices determined by government policy; it would allow escape from the confines of a narrow domestic market; it would open new horizons for entrepreneurship; and, most important, it would help to clean up domestic politics.” Separate out and identify the arguments for free trade in this statement.

   In the order in which they are presented, the arguments are:

   1) Free trade permits households and firms to condition their economic behavior on marginal costs and benefits, undistorted by government policy.

   2) Resource constraints mean that, through trade, consumers will have access to a broader range of commodities than would be possible under autarky; in addition, if there are economies of scale, trade permits a more rational division of labor.

   3) “New horizons for entrepreneurship” also implies some form of economy of scale, in this case in terms of the application of entrepreneurial effort.

   4) Many forms of trade policy generate rents that may be captured by political effort (e.g. access to import licenses or foreign exchange). Eliminating the policies that generate these rents eliminates the incentive to engage in such rent-seeking behavior.

2. Which of the following are potentially valid arguments for tariffs or export subsidies, and which are not (explain your answers)?

   a. “The more oil in the US imports, the higher the price of oil will go in the next world shortage”.

   This is a potentially valid argument based on a (somewhat peculiar) mix of the optimal tariff and insurance arguments for protection. The optimal tariff argument suggests that, since the US is large in the market for oil, restricting current consumption will hold down the price so that future price increases occur from a lower base. The core of this statement, however, seems to be an insurance argument which is unrelated to market power: protection will raise the price of oil to domestic producers, increasing production and exploration, and ensuring a domestic supply in the future. However, in general, one would expect the argument to go the other way: if we are worried about future disruptions, we should consume as much low priced current oil as possible to ensure that we don’t use up all the readily available domestic oil.

   b. “The growing exports of off-season fruit from Chile, which now accounts for 80 percent of the U.S. supply of such produce as winter grapes, are contributing to sharply falling prices of these former luxury goods.”
Off-season exports are, almost by assumption, non-competing good. Thus, any policy which raises their price lowers consumer welfare, without benefitting anyone (except the government, which collects the revenues). Two caveats: if the US is large in the market for winter fruits, then an optimal tariff will induce an even faster fall in prices; and, winter fruits and vegetables are, in fact, produced by states like Florida, Louisiana, California, and Hawaii, so a tariff might be a second-best way of protecting, say, immobile labor in those states.

c. “U.S. Farm exports don’t just mean higher incomes for farmers—they mean higher income for everyone who sells goods and services to the U.S. farm sector.”

This is a potentially valid second best argument. Stimulating the farm sector may well be a goal of the government, and protection to this sector could accomplish that goal. However, it is not an efficient intervention, since a direct subsidy to the farm sector would not entail the consumer loss generated by the tariff.

d. “Semiconductors are the crude oil to technology: if we don’t produce our own chips, the flow of information that is crucial to every industry that uses microelectronics will be impaired”.

This statement seems to combine an externality argument with a national defense/insurance argument. If such an externality, or threat to supply, exists, a second-best argument can be launched. However, a direct subsidy to production would appear to be first-best.

e. “The real price of timber has fallen 40 percent, and thousands of timber workers have been forced to look for other jobs.”

Again, this statement creates the basis for a second-best argument for protection. That is, the government could quite reasonably decide to protect the jobs of timber workers and, if the first best policy of a subsidy to employment is unavailable for some reason, there may be a tariff that would be welfare increasing. However, the optimal policy will have a lower welfare cost than the trade policy.

3. A small country can import a good at a world price of 10 per unit. The domestic supply curve of the good is:

\[ S = 50 + 5P. \]

The demand curve is

\[ D = 400 - 10P. \]

In addition, each unit of production yields a marginal social benefit of 10.
a. Calculate the total effect on welfare of a tariff of 5 per unit levied on imports.

We can solve for the free trade volumes, \( S = 100 \) and \( D = 300 \), so \( M = (300 - 100) = 200 \). A specific tariff raises the domestic price to 15, so: \( S = 125 \), \( D = 250 \), and \( M = 125 \). Local production has increased by 25 and consumption has fallen by 50. The direct welfare effect of the tariff is a net loss of \( [(25 \times 5)/2 + (50 \times 5)/2] = 62.5 + 125 = 187.5 \). But each additional unit produced generates a gain of 10, so we must include \((25 \times 10) = 250\), so total welfare effect is 250 - 187.5 = 62.5.

b. Calculate the total effect of a production subsidy of 5 per unit.

With a production subsidy, domestic producers receive 15 per unit, increasing supply to 125, for a net gain of 25. This entails the welfare gain of 250 and the production welfare loss of 62.5, however, the consumer loss is eliminated, since consumers can still consume at a price of 10. Thus, net welfare effect is 250 - 62.5 = 187.5.

c. Why does the production subsidy produce a greater gain in welfare than the tariff?

By avoiding the consumption deadweight loss, the production subsidy reaps a greater net welfare gain. The essence of the targeting step in the theory of economic policy is the recognition that a tariff is equivalent to a combined production subsidy and consumption tax at the same rate. Since both elements entail costs, if the goal is related to only production (or only consumption) a policy targeted on that goal will always be lower cost than a trade policy.

d. What would the optimal production subsidy be?

Note that the government’s objective function is to maximize a welfare function of the following form:

\[
W = CS + PS + R + E,
\]

where \( CS \) is consumer surplus, \( PS \) is producer surplus, and \( E \) is the social gain from increased output. We have already seen that the optimal policy will involve a production subsidy. As long as the resources needed to provide the subsidy are raised in a non-distorting fashion, and directly transferred to the industry, this is a pure transfer. The only net welfare effects are the externality and the production deadweight loss, the government seeks to maximize the former net of the latter. That is, if we let \( G \) be the welfare gain due to the subsidy, the government seeks to choose the subsidy (\( F \)) to:

\[
\max_\sigma G = E - DWL.
\]

We have explicit expressions for both \( E \) and \( DWL \), so we can solve this explicitly. Specifically,
\[ E = 10[SN - S] \] and \[ DWL = \frac{\sigma [S' - S]}{2} \] (where \( SN \) is supply under the subsidy regime and \( S \) is supply with no subsidy). However, the term in square brackets, the difference between \( SN \) and \( S \), can be given explicit form using the definitions: \( SN = 50 + 5(P + F) = 50 + 5F + 5P \); and \( S = 50 + 5P \). Thus, \([SN - S] = 5F\). Thus, we can rewrite the government’s problem as:

\[ \max G = 50\sigma - \frac{5\sigma^2}{2}. \]

This can be solved for a maximum in the usual fashion:

\[ \frac{dG}{d\sigma} = 50 - 5\sigma = 0 \]

\[ \sigma = 10 \]

Thus, the optimal subsidy is 10. This is the subsidy that induces the industry to internalize the social gain.

4. Suppose that demand and supply are exactly as described in problem 3 but there is no marginal social benefit to production. However, for political reasons the government counts a dollar’s worth of gain to producers as being worth $2 of either consumer gain or government revenue. Calculate the effects on the government’s objective of a tariff of 5 per unit.

This is the same policy as above, so we know the effect of the tariff on supply and demand: \( SN = 125 \) and \( DN = 250 \).

In this case, the government’s objective function is

\[ \max W = CS + 2PS + R. \]

That is, producer income is valued twice as highly as consumer income. Recall that \( CS \) is made up of the higher price on all units still consumed \( (5 \times 250 = 1250) \) plus the DWL from consumption \( [(50 \times 5)/2 = 125] \), so \( CS = -12375 \). \( PS \) is the higher price received on each unit sold \( [5 \times 125 = 625] \), less the DWL from inefficient production \( [(25 \times 5)/2 = 62.5] \), so \( PS = 562.5 \), but each of these dollars is work 2 to the government, so the value to the government is \( 2(562.5) = 1125 \). Trade volume is 125, so tariff revenue is \( 5(125) = 625 \). The change in welfare due to the tariff is thus:

\[ W = -1375 + 2(562.5) + 625 = 375. \]

5. “There is no point in the U.S. complaining about trade policies in Japan and Europe. Each country
has a right to do whatever is in its own best interest. Instead of complaining about foreign trade policies, the U.S. should let other countries go their own way, and give up our won prejudices about free trade and follow suit’. Discuss both the economics and the political economy of this viewpoint.

6. Which of the following actions would be legal under GATT, and which would not?

   a. A U.S. tariff of 20 percent against any country that exports more than twice as much to the
U.S. as it imports in return.

   This is not GATT legal. This is the sort of thing Congress had in mind with its Super 301
legislation which, among other things, asked the USTR to specify priority countries based on
measures such as this. Policies such as this were widely seen as contravening US commitments
under the GATT.

   b. A Subsidy to U.S. wheat exports, aimed at recapturing some of the markets lost to the
European Union.

   Tricky one. Over most of GATT history, agriculture was not covered by the GATT. US
policies like Public Law 480 (Food for Peace), are export subsidies for agricultural goods.
However, export subsidies are not generally GATT legal and, with the Uruguay round’s
commitment to bring agriculture fully under WTO/GATT discipline, this would have to be
GATT illegal.

   c. A. U.S. tariff on Canadian lumber exports, not matched by equivalent reductions on other
tariffs.

   Not GATT legal.

   d. A Canadian tax on lumber exports, agreed to at the demand of the U.S. to placate U.S.
lumber producers.

   This is GATT legal. This is just a VER.

   e. A program of subsidized research and development in areas related to high technology goods
such as electronics and semiconductors.

   This is GATT legal, there is no trade component to the policy.

   f. Special government assistance for workers who lose their jobs because of import
competition.

   This is GATT legal.
7. As a result of political and economic liberalization in Eastern Europe, there has been widespread speculation that Eastern European nations such as Poland and Hungary may join the European Union. Discuss the potential economic costs of such expansion of the European Union, from the point of view of

a. Western Europe

b. Eastern Europe

c. Other nations.