

Place your name on the back of this sheet of paper and nowhere else. Staple your answers face up on the front of this sheet of paper. Failure to follow these directions will cost you 10 points. Your assignment will be typed, except graphs can be drawn by hand and mathematical equations can be done by hand. Failure to type this assignment will cost you 10 points. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

1) (30 points) Draw the PPF/CPF/indifference curve diagram for a large country which is capital abundant. Draw the effects of technological progress in the capital intensive industry such that immiserizing growth occurs. Explain why the curves moved as drawn and how your diagram shows immiserizing growth.

Since the country is capital abundant, the PPF goes up more than it goes right and they export cars. The exports are seen between the production point  $P_0$  and the consumption point  $C_0$ . With technological advance in cars, the vertical intercept moves up while the horizontal intercept does not change. Since they are producing more cars and are a large country, the world price of cars drops. This is seen by the CPF a.k.a. TOT getting steeper. The diagram shows immiserizing growth because the new consumption point  $C_1$  is on a lower indifference curve than the old consumption point  $C_0$ .

2) (30 points) Draw the S/D diagram for a product the large country imports. Draw the effects of an implementation of an import tariff. Mark the areas. Find the consumer surplus before and after the tariff, producer surplus before and after the tariff, tax revenue, and dead weight loss. State how you found each. As drawn, does the country gain or lose from the tariff? State how you know.

When they implement an import tariff, that raises the price to our consumers to  $P_T$ . Because we buy less, the world price goes down to  $P_{W1}$ . Consumer surplus (CS) is from the demand down to the price the consumer pays and out to the quantity they buy. Initially, the price was  $P_{W0}$  and with the tariff, it is  $P_T$ . Producer surplus (PS) is the area between the supply curve and the price they receive out to the quantity they produce. They have the same prices as the consumer, but they produce less than the consumer buys. The tariff revenue is the area between the new world price and the new home price, for the volume imported. The volume imported is between the new  $Q_{S1}$  and  $Q_{D1}$ . The dead weight loss (DWL) is the areas lost in the column. Another way to find DWL is the triangles between the optimal P, Q and the actual P, Q. So, D is DWL from producing too much and F is the DWL from consuming too little. The gain is the revenue from tariffs which we get from foreigners. The tariff causes them to lower their pre-tax price. So the part of the tax revenue below the original price is a gain. In this case, the country gains because  $J > D + F$ .

Item	Free Trade	Tariff
CS	ABCDEF	AB
PS	GM	CGM
Tariff Rev.	–	EJ
Total	A-G, M	ABCEGJM
DWL	–	DF
Gain	–	J

3) (30 points) Draw the S/D diagram for a product the small country exports. Draw the effects of an implementation of an export tariff. Mark the areas. Find the consumer surplus before and after the tariff, producer surplus before and after the tariff, tax revenue, and dead weight loss. State how you found each. As drawn, does the country gain or lose from the tariff? State how you know.

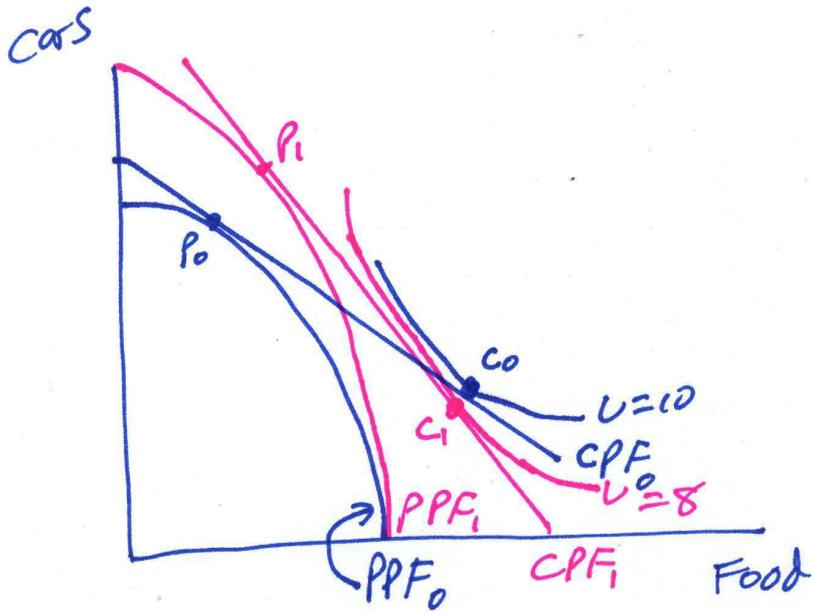
Item	Free Trade	Tariff
CS	A	ABC
PS	BCDEFGHIJ	GHIJ
Tariff Rev.	–	E
Total	A-J	ABCEGHIJ
DWL	–	DF

The consumer surplus (CS) is from the demand down to the price the consumer pays and out to the quantity they buy. Initially, the price was  $P_w$  and with the tariff, it is  $P_w - T$ . Producer surplus (PS) is the area between the supply curve and the price they receive out to the quantity they produce. They have the same prices as the consumer, but they produce more than the consumer buys. The tariff revenue is the area between the world price and the new home price, for the volume imported. The volume imported is between the new  $Q_{S1}$  and  $Q_{D1}$ . The dead weight loss (DWL) is the areas lost in the column. Another way to find DWL is the triangles between the optimal P, Q and the actual P, Q. So, F is DWL from producing too little and D is the DWL from consuming too much.

4) (10 points) Suppose a country has an import tariff on all imported parts of 20% and an import tariff on final products of 13%. If an industry which competes against imports, has 30% of its parts imported, then what is the effective rate of protection,  $g$ ? Show all calculations. If  $g > t$  then explain the economics of why. If  $g < t$ , then explain the economics of why.

The formula for  $g = (t - a_i * t_i) / (1 - a_i) = (.13 - .3 * .2) / (1 - .3) = .07 / .7 = .10 = 10\%$ .  $g < t$  because the revenue the firm gets is increased by 13% while the costs of imported parts are increased 20%. So, they are hurt more than they are helped.

# 1



# 2

