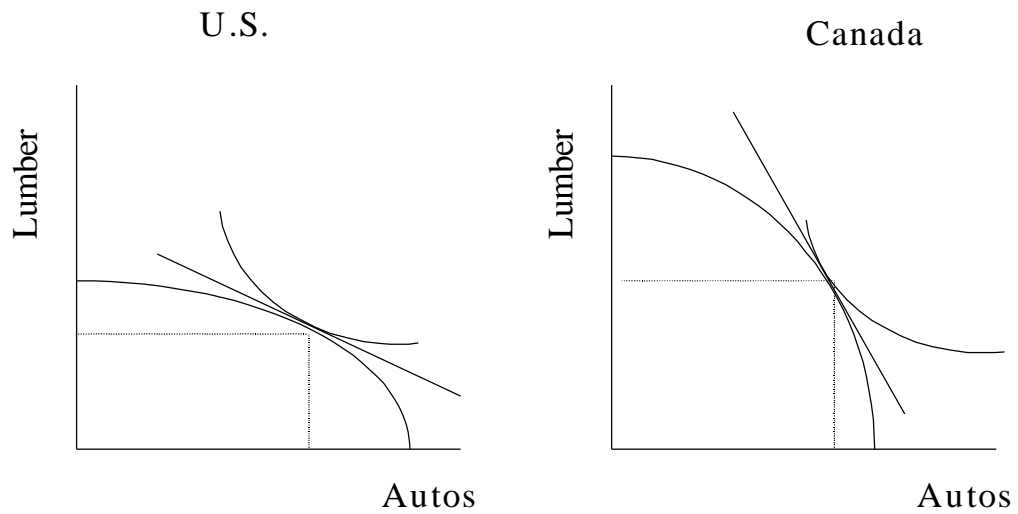
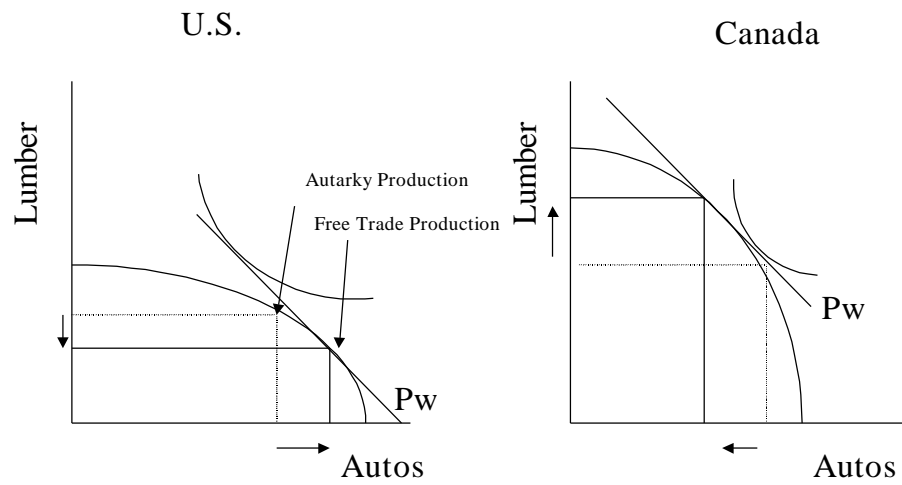


**Problem Set 3 - Answers**

1. a)

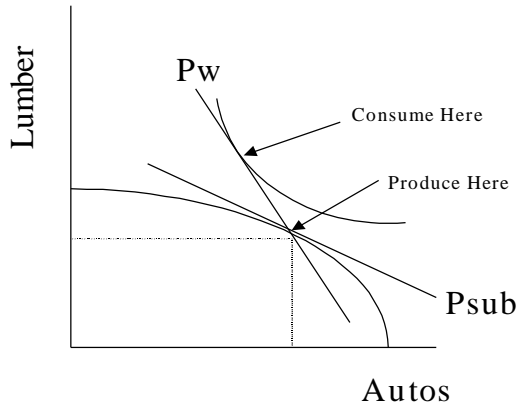


b) A move to free trade will worsen acid rain in Canada, since the U.S. has comparative advantage in automobiles and will therefore produce more automobiles and less lumber in free trade equilibrium, as shown in the diagram below.

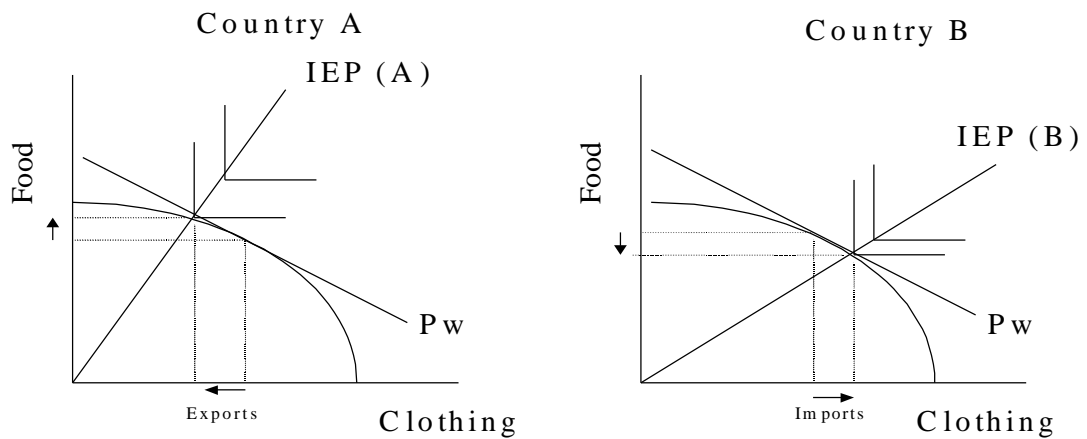


- c) A production subsidy to lumber production in the U.S. could keep Canadian acid rain at its autarky level while continuing to allow the U.S. to share in the gains from trade, as shown below. Note that the U.S. makes its production decision based on the prices including the subsidy ( $P_{sub}$ ), but then consumes at world prices,  $P_w$ .

U.S. Market in Free Trade Equilibrium  
with Lumber Subsidy

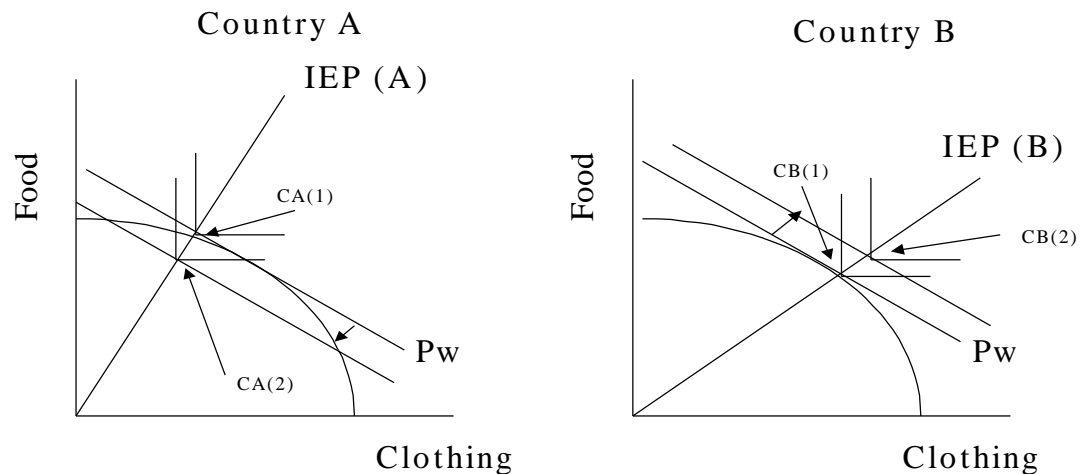


2. No – country A enjoys a secondary blessing, not a burden. To see this, first note that both countries have identical PPFs, as shown below. Given preferences, we can see that that country A is a net importer of food, while B is a net exporter of food.

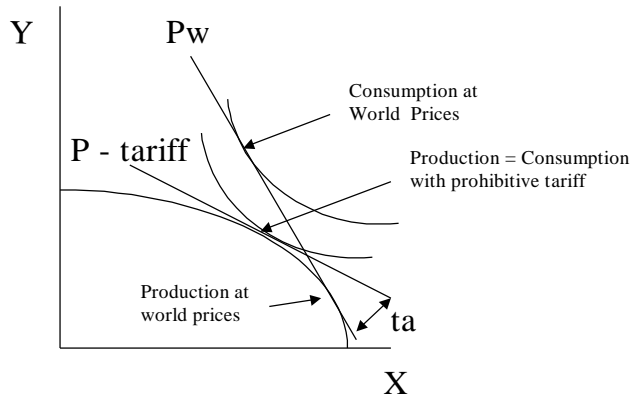


At the original world prices, country A's loan to country B has the direct effect of shifting its consumption from  $C_1^A$  to  $C_2^A$ . Since production hasn't

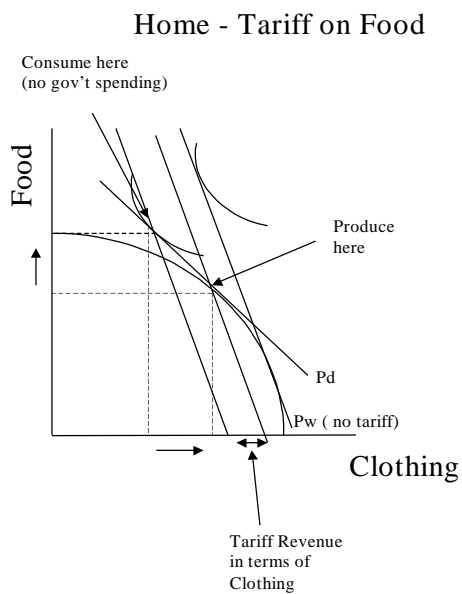
changed, country A must be importing less food. Similarly, B's consumption increases from  $C^B_1$  to  $C^B_2$ . Again, since production has not changed, country B must be exporting less food. Noting the slopes of the income expansion paths for countries A and B, we can see that country A's consumption of food will fall twice as much as country B's consumption of food will increase. As a result, if we examine the market for food, we see that A's import demand declines more than B's export supply decreases. This causes the world price of food to fall (relative to the price of clothes). Since Country A exports clothing, and the relative price of clothing has increased, A must experience a secondary blessing (an improvement in its terms of trade.) Another way of saying this: since the country receiving the transfer has a higher marginal propensity to consume the transferring country's export good than did the transferring country itself, the relative price of the transferring country's export good must rise (since world demand for the good increased).



3. The prohibitive tariff,  $t^a$ , is the difference between the world and domestic prices pictured below. Any tariff increase beyond the prohibitive tariff would have no effect on the economy, since the economy is already operating in autarky, and so a further increase in the tariff rate would have no effect on the domestic relative prices of this economy.



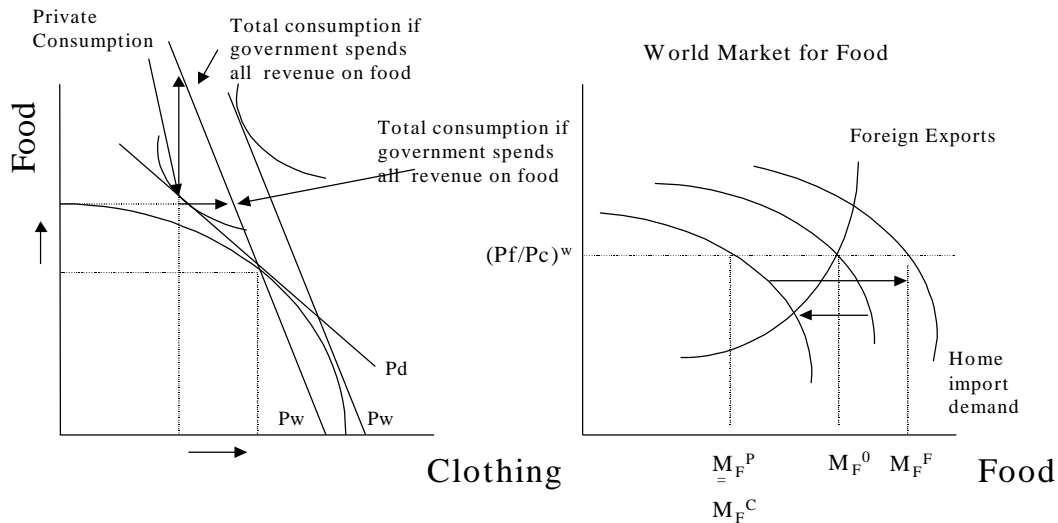
4. Recall from class the basic trade model diagram where Home exports clothing and imports food. A tariff on home's import good, food, will decrease the relative price of clothing domestically, shifting production from clothing to food. At the original world prices *with* the tariff,  $P_d$ , as depicted on the graph below. (This assumes initially that the government does not spend its revenue on anything).



Now consider the effect of spending tariff revenue on world prices. Recall that imports of food,  $M_f = C_f - Q_f$ , where  $C_f$  denotes consumption of food, and  $Q_f$  denotes quantity of food produced. Call the pre-tariff import level  $M_F^0$ . At the original world prices, the tariff causes  $Q_f$  to increase and  $C_f$  to decrease (notice that the income and substitution effects work in the same direction.) Hence, at the original world prices,  $M_f$  falls to  $M_F^P$ , if the government does not spend the tariff revenue. Now there are two possibilities.

- a) The government could spend all tariff revenue on food. If this is the case, then  $M_F$  shifts out from  $M_F^P$ , and *could* even shift out beyond the original (pre-tariff) import demand curve, in which case  $M_F^F$  would be greater than  $M_F^0$ , as pictured below. In this perhaps extreme case, where  $M_F^F > M_F^0$ , Home's terms of trade deteriorate, since home is a net exporter of clothes.
- b) If, on the other hand, the government were to spend all tariff revenue on clothing,  $M_F$  would stay put at  $M_F^P$ ; we can denote this by  $M_F^C$ . Notice that this policy improves Home's terms of trade.

### Home - Government spends all Revenue on Food or Clothing

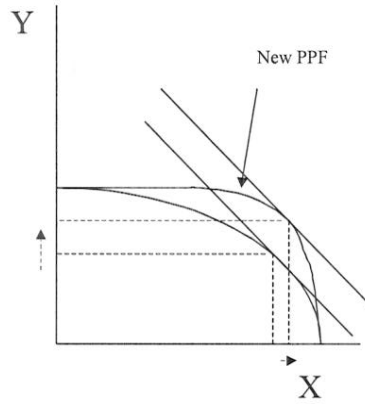


- 5. False. (Not necessarily true.) Typically, if a country is large in the world market, we assume that it can influence world price via fluctuations in its export supply (or import demand). Ordinarily, if a country experiences an improvement in its export technology, its PPF shifts towards the export sector, causing production of the export good to increase. Assuming that both import

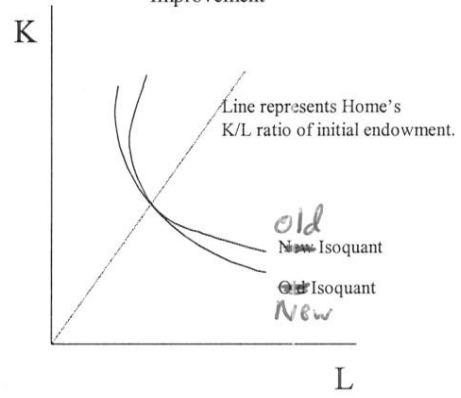
and export goods are normal, the increase in income will cause more of both goods to be consumed. If consumption of imports increases, and production of imports is lower than before the technology change, imports must increase. For trade to be balanced, export supply must increase, causing a decline in the home country's terms of trade.

As mentioned above, however, this will not *necessarily* be the case. A shift in technology could cause, for example, the PPF simply to bow out more than it did before, as shown below. If this is true, then at initial world prices more of *both* goods will be produced. As a result, even if preferences are normal, it may be the case that export supply falls (as would import demand). The fall (leftward shift) in export supply would then cause the world price of the large country's export good to increase – a terms of trade improvement.

### Home (Large)



### Change in Isoquant Caused by Technological Improvement



### Market for good X

