

Economics 39F
Problem Set 3

1. Consider a world of two goods, automobiles and lumber, and two countries, the United States and Canada.

a). Using the Basic Trade Model, graphically depict autarky equilibria for the two countries, in which the United States has a comparative advantage in automobiles.

b). Next assume that acid rain in Canada is an increasing function of automobile production in the United States (Canadian automobile production is assumed not to contribute to the Canadian acid rain problem). Will a move from autarky to free trade worsen or improve the acid rain problem in Canada? Support your answer with a graph.

c). Finally, describe graphically a production subsidy policy which, if pursued by the United States government, could keep Canadian acid rain at its autarky level and still allow the United States to enjoy some of the gains from trade with Canada.

2. Suppose that the preferences of country A and country B differ, but that each is inflexible: country A consumes food and clothing in proportions 2:1 (at any prices), while country B always consumes food and clothing in equal proportions (1:1). The two countries have identical bowed-out production possibilities frontiers. What happens to country A's terms of trade if it makes a consumption loan to country B? Is there a secondary burden of the loan?

3. Draw an initial free-trade equilibrium for a small country facing fixed world prices, depicting its production possibilities frontier and relevant indifference curves.

a). Indicate in your diagram the rate of the tariff that would completely wipe out trade between this country and the rest of the world.

b). What happens to production and consumption if legislators are over-zealous and the tariff rate is set higher than this rate?

4. In class we assumed that the government redistributes tariff proceeds back to the private sector. Instead, suppose the government spends the tariff revenue in a manner that differs from that of private citizens. Consider two extreme forms of public spending: (i) the tariff revenue is spent only on clothing, the commodity exported, and (ii) the tariff revenue is allocated instead to the purchase of food.

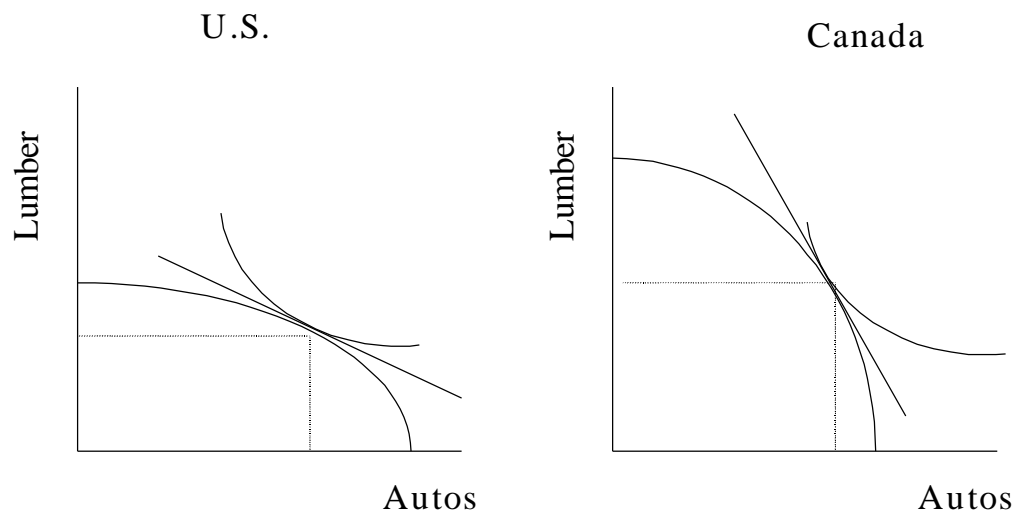
a). Which scheme is more likely to be favored by producers who have clamored for import protection?

b). What might happen to the terms of trade in case (ii)?

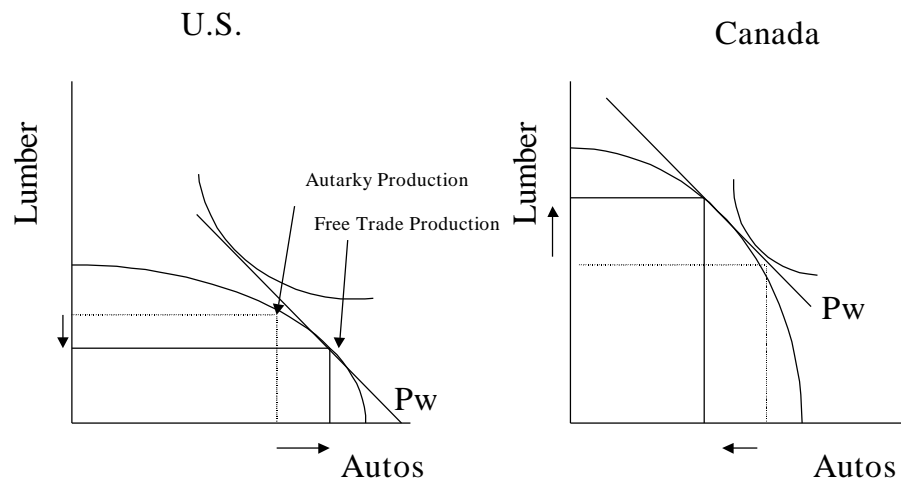
5. True/False Explain: According to the Basic Trade Model, if a country is “large” in world markets and experiences a technological improvement in the good that it exports, then the country’s terms of trade must decline.

Problem Set 3 - Answers

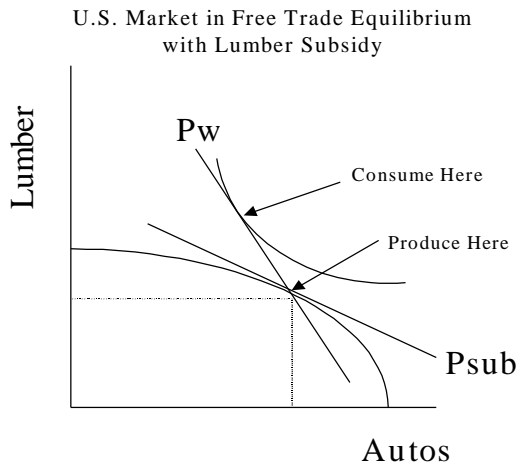
1. a)



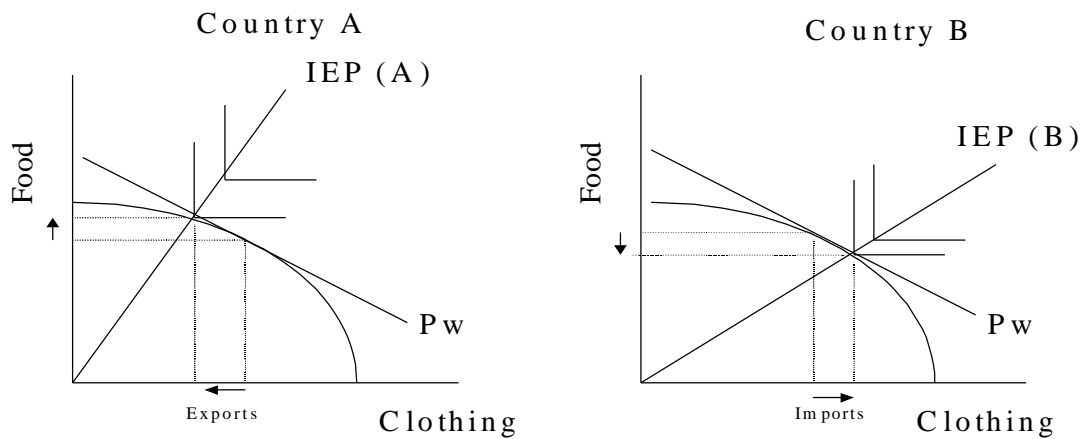
- b) A move to free trade will worsen acid rain in Canada, since the U.S. has comparative advantage in automobiles and will therefore produce more automobiles and less lumber in free trade equilibrium, as shown in the diagram below.



- 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 .

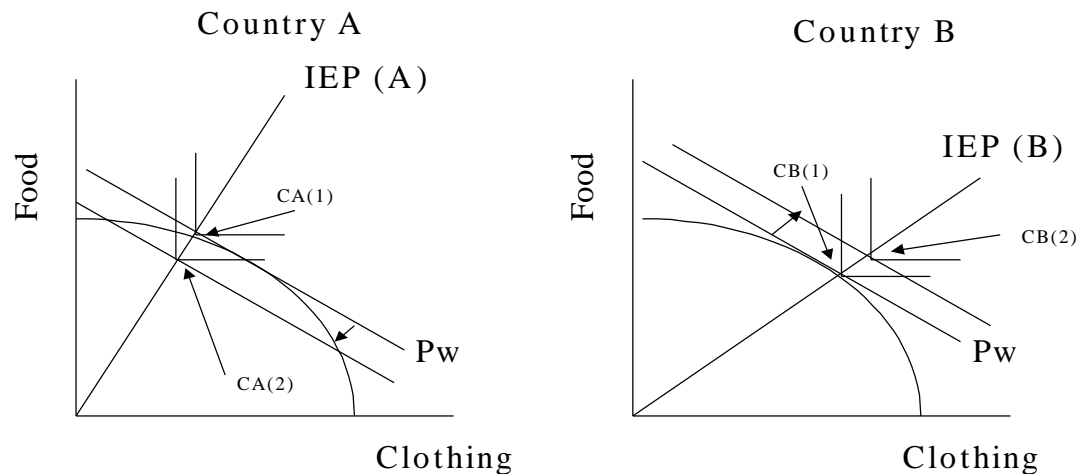


2. No – country A enjoys a secondary blessing, not a burden. To see this, first note that both countries have identical PPFs, as shown below. Given preferences, we can see that that country A is a net importer of food, while B is a net exporter of food.

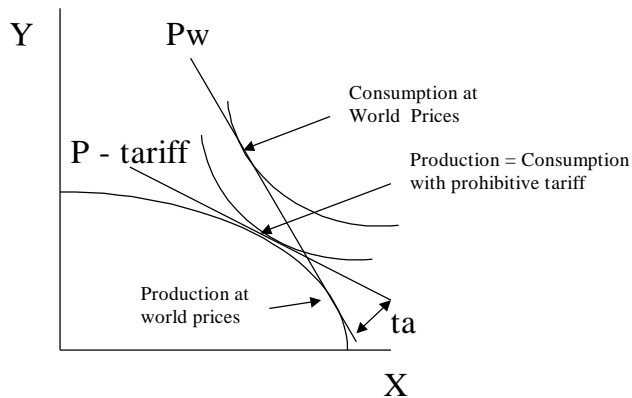


At the original world prices, country A's loan to country B has the direct effect of shifting its consumption from C_1^A to C_2^A . Since production hasn't

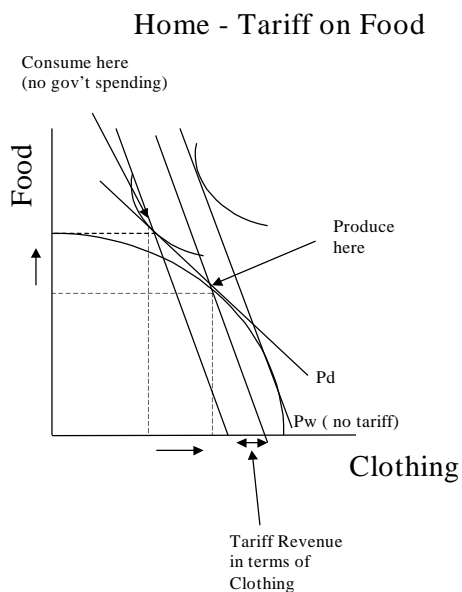
changed, country A must be importing less food. Similarly, B's consumption increases from C^B_1 to C^B_2 . Again, since production has not changed, country B must be exporting less food. Noting the slopes of the income expansion paths for countries A and B, we can see that country A's consumption of 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.



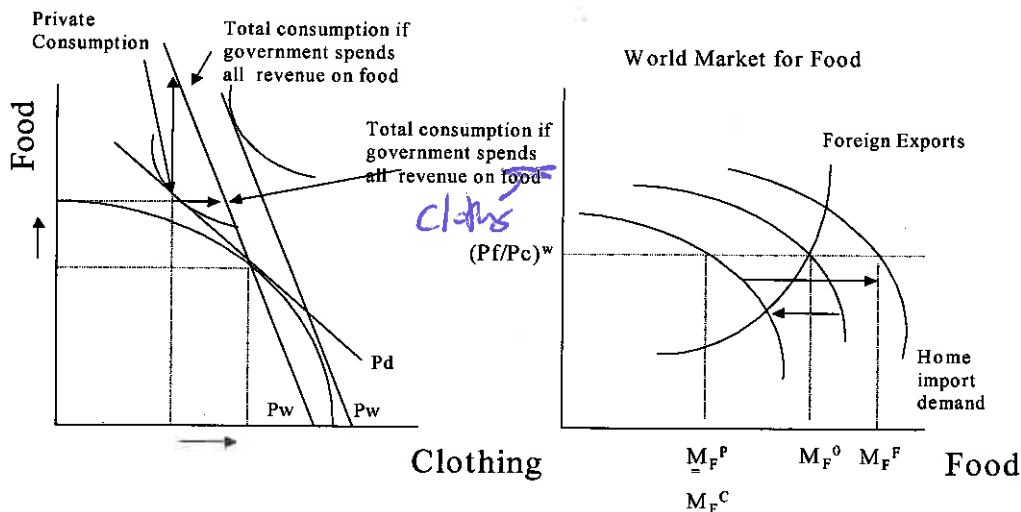
4. Recall from class the basic trade model diagram where Home exports clothing and imports food. A tariff on home's import good, food, will decrease the relative price of clothing domestically, shifting production from clothing to food. At the original world prices *with* the tariff, P_d , as depicted 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

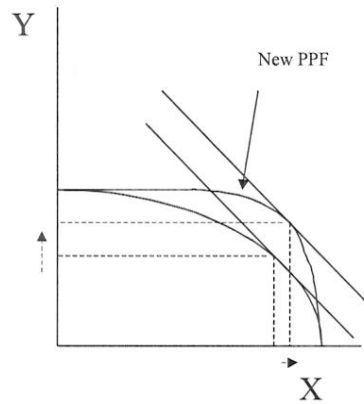


5. False. (Not necessarily true.) Typically, if a country is large in the world market, we assume that it can influence world price via fluctuations in its export supply (or import demand). Ordinarily, if a country experiences an improvement in its export technology, its PPF shifts towards the export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

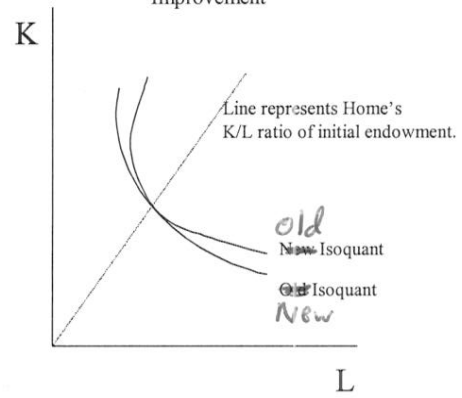
and export goods are normal, the increase in income will cause more of both goods to be consumed. If consumption of imports increases, and production of imports is lower than before the technology change, imports must increase. For trade to be balanced, export supply must increase, causing a decline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

