

Exam ECON2610 H2023 postponed

Problem 1

a) The candidate should, at a minimum, show graphically changes in producer surplus, consumer surplus and government revenue when tariffs are increased. Bonus if the candidate shows how world market prices are determined (import demand curve and export supply curve). Since the U.S. is a large economy, it is reasonable to assume that world market prices are changing due to the tariff increase.

b) The welfare effect is ambiguous. The candidate should discuss the reasons why, i.e. that the magnitude of the terms of trade effect is key.

c) A positive tariff may be optimal when terms of trade effects are large. The candidate should at a minimum provide intuition for why a tariff increase from 3 to 4% may increase national welfare but that a tariff increase from 100 to 101% most likely will not (as imports become prohibitively costly at some point).

d) Here, import demand is very elastic. If so, a tariff will decrease world market prices a lot, while U.S. prices will not increase much. The candidate should provide economic intuition for this result (either with words, diagrams or math).

Problem 2

a) The first order conditions / reaction functions are ($b = 60$)

$$x_i = \frac{b}{2} + \frac{x_j}{2}$$

The Nash equilibrium must satisfy

$$\begin{aligned}x_i &= \frac{b}{2} + \frac{\frac{b}{2} + \frac{x_i}{2}}{2} \\x_i - \frac{1}{4}x_i &= \frac{3b}{4} \\x_i &= b\end{aligned}$$

The payoffs are

$$\begin{aligned}u_i &= 2000 + b^2 + b^2 - b^2 - 90b \\&= 2000 + b^2 - 90b\end{aligned}$$

With $b = 60$, we get $x_i = x_j = 60$ and $u_i = u_j = 200$

b)

1. The US reaction function is

$$x_1 = \frac{b}{2} + \frac{x_2}{2}$$

So if $x_2 = 0$, we get $x_1 = b/2 = 30$.

And payoffs are

$$\begin{aligned} u_1 &= 2000 + 30b - 30^2 \\ &= 2900 \end{aligned}$$

$$\begin{aligned} u_2 &= 2000 + bx_2 + x_1x_2 - x_2^2 - 90x_1 \\ &= 2000 - 90x_1 \\ &= -700 \end{aligned}$$

2. If tariffs are zero, we get

$$u_1 = u_2 = 2000$$

Economic intuition:

- Comparing the Nash equilibrium to free trade, we observe that both countries lose because of the trade war. Hence, there is a need to coordinate on trade policy to avoid a trade war.
- If China does not respond, the U.S is better off compared to both the Nash equilibrium ($u_1 = 2900$ vs $u^{Nash} = 200$) and free trade ($u_1 = 2900$ vs $u_1^{freetrade} = 2000$). The no-resonse scenario is essentially what we analyzed in Problem 1.
- Comparing the situation under b1) versus the Nash equilibrium, we observe that the tariff is lower under b1) than the Nash equilibrium ($x_1 = 30$ rather than $x_1^{Nash} = 60$). The Nash equilibrium/trade war scenario pushes tariffs even higher because of the retaliation response.
- Clearly, it is not optimal for China not to respond, as $u_2 = -700$ under b1) versus $u_2^{Nash} = 200$ in the Nash equilibrium.