MOT 112A Economic Foundations

Exercises –Trade Policy (Lecture Week 5a)

Exercise 1 – Import tariffs and export subsidies under perfect competition

Consider the EU industry for electric cars. Assume that the EU is a small open economy and that the electric car industry is characterised by perfect competition. Furthermore, it is an import-competing industry.

1. Depict the free trade equilibrium in an output-price diagram (partial equilibrium). Briefly discuss what determines (i) the domestic price level, (ii) domestic output, (iii) consumption and (iv) imports. Mark all relevant points in your diagram.
   Note: If you prefer to illustrate a concrete numerical example, you can use the following demand and supply schedules for the output-price diagram:
   Demand: $Q^D(P) = 120 - P$; *Supply:* $Q^S(P) = 2P$ and a world market price of $P^W = 20$.
   If you are curious, also solve for the equilibrium algebraically!
2. Starting from the free trade equilibrium, discuss how the domestic price level, domestic output, consumption and imports change, when the EU decides to levy a tariff on the imports of electric cars. Add the new equilibrium with the tariff in place. For your analysis assume, that the tariff is not 'prohibitive', that is, there are still imports after the introduction of the tariff.
   Note: If you want to continue with the numerical example, assume that the tariff levied by the EU is a specific tariff (tariff levied per unit of import) of $t = 10$.
3. Discuss the welfare implication of the tariff for the EU, including the changes in each of the relevant elements – producer surplus, consumer surplus, tariff revenue. Explain the reasons for the changes in welfare. If you deem useful, you can use your diagram for your argumentation.
4. Given the welfare implications of the tariff that you identified, can you think of any reasons why essentially all governments make use of import tariffs?

Exercise 2 – The infant industry argument

Consider again the EU industry for electric cars. In contrast to Exercise 1, assume now that there are substantial learning effects present in the electric car industry which give rise to external returns to scale. Assume further that because EU producers focused strongly on the markets for combustion engine vehicles, the EU electric car industry is still in its infancy (initial production is zero) and that initial average costs of EU producers (AC^{EU}) are well above the prevailing world market price P^W. The world market is currently served by US producers (imagine a large number of Teslas) and the EU is open to trade.

1. Use this constellation to explain the concept of 'latent comparative advantage'.
2. Depict the initial market situation in a diagram. Explain why in this situation, an EU electric car industry will not develop.
3. Assume now that the EU imposes an infant industry tariff. Illustrate the consequences of this measure in a diagram. In this, assume further that the cost structures of the EU and the US are such the infant industry tariff is successful.
4. Discuss verbally, the expected outcome in the industry if China enters the market, assuming that that China has latent comparative advantage vis-à-vis the EU in the production of electric cars.
5. Can you think of any practical difficulties in the application of infant industry tariffs (apart from the entrance of new competitors)? Choose one of the cases and represent it graphically (similar illustration as in 3.) but in a situation where the infant industry tariff is not successful.

Exercise 3 – Strategic Trade Policy

Assume that after fierce international competition and a number of mergers[1] between electric car producers, the electric car industry has become an oligopolistic market with high economic rents to be earned. More precisely, there are only two producers left, which are Stellantis, an EU producer; and BYD, a Chinese producer.

Both producers have to decide whether to invest in the development of the next generation of electric cars and then to produce it. All cars are sold on third markets. The pay-offs to firms (profits) are as follows. When none of the two producers decide to produce the pay off to both firms is zero. If only BYD produces its pay off is +120 and Stellantis has a pay off of 0; if only Stellantis produces its pay off is +80 and BYD has a pay off of 0. If both firms produce each of them incurs a loss of -10.

1. Set up the pay off matrix for the electric vehicles industry for the two firms.
2. Which outcome is likely to emerge? Which outcome will materialise, if BYD has a small head start? Explain why this outcome will emerge.
3. How will the outcome change if Stellantis receives a subsidy of 40 from a newly established fund under the EU's Net-Zero Industry Act? Set-up the new pay-off matrix and use it to explain the new outcome (Note: the subsidy is only provided when Stellantis decides to produce).
4. Would you consider the measure as successful when its objective was to maximise domestic profits?
5. What complications could arise when subsidies are used strategically to support domestic producers in industries characterised by economic rents
6. How would the analysis of the EU subsidy change, if the initial pay-off in a situation where both firms produce is as follows: Stellantis -10 ; BYD +10. All other pay-offs and conditions as well as the size of the EU subsidy remain the same.

[1] In a merger two or more previously independent firms decide to form one firm.