

Problem 1 (30%)

During the COVID-19 pandemic, policymakers were concerned about the availability and delivery of personal protective equipment (PPE), e.g. face-masks, to Norway. A policymaker suggests that we should produce more PPE ourselves, and that we should use tariffs on PPE to protect the domestic market and encourage domestic production.

a) Analyze the market for PPE in partial equilibrium, before the tariff is introduced. Derive the import demand curve for Norway and the export supply curve for the rest of the world (ROW). Assume that Norway is initially a net importer of PPE.

b) Analyze the impact of a PPE tariff on domestic production, consumption and prices.

c) Analyze the impact of a PPE tariff on producer and consumer surplus as well as overall welfare for Norway. Discuss the role of terms of trade in this context.

d) Is the economic analysis above sufficient to analyze the problem? Are there factors outside the model that also need to be considered? Discuss briefly.

Your answers should be accompanied by either figures or math (or both).

Problem 2 (20%)

In ROW, there is growing support for an export tax on PPE in order to ensure availability of face-masks in ROW. Analyze the impact of the export tax on prices and welfare in both ROW and Norway.

Problem 3 (30%)

Businesses express a concern that the Norwegian PPE tariff policy will boost labor demand and therefore increase real wages. Assume that

- there are two inputs into production, labor and capital, and two sectors, PPE and other goods.
- PPE production is relatively labor intensive.

- a) Evaluate whether this is a valid concern in the short run (labor is mobile but capital is not).
- b) Evaluate whether this is a valid concern in the long run (both labor and capital is mobile).
- c) Explain why/why not the short- and long-run response may differ.

You should explain the economic mechanisms and intuition with words and diagrams.

Problem 4 (20%)

After 10 years, a committee is established to evaluate the performance of the Norwegian PPE industry. They are presented with the following data:

| | Output | Employment | Capital |
|------|--------|------------|---------|
| 2021 | 100 | 15 | 10 |
| 2026 | 300 | 30 | 20 |
| 2031 | 600 | 60 | 60 |

a) Assume that the production function is $Y = AK^\alpha L^{1-\alpha}$, where $\alpha = 1/2$, Y is output, A is productivity, K is capital and L is labor. Derive the method of growth accounting and calculate 2021-2026 and 2026-2031 productivity growth.

b) After publishing the initial findings, the committee is criticized because they did not take into account human capital when calculating productivity. Show mathematically how including human capital alters the growth accounting method. Do you think the findings for productivity in a) are too big or too small?