Problem 1 (60%)

It is sometimes claimed that large countries will grow faster, e.g., in terms of GDP per capita, than small countries, because a large country will generate more ideas and technological breakthroughs.

Consider a closed economy model with labor as the only factor of production. Individuals can work in manufacturing or in research and development (R&D). Productivity growth is a function of the number of R&D workers and the cost of R&D.

a) Analyze the claim above.

b) Consider an open economy extension of the model, where ideas diffuse from the large to the small country. The costs of imitation are a function of the productivity gap between the large and small country. What are the steady-state growth rates in the small and large country? What are the levels of GDP per capita in the small and large country?

c) In the context of the model, is there anything policymakers can do to increase the rate of economic growth?

d) Discuss the potential weaknesses of the model.

For all questions, you should apply theory and explain your reasoning using figures and/or math. You should explain the economic mechanisms and intuition.

Problem 2 (40%)

Prices on many goods are higher in Norway compared to Germany. Some economists claim that this is becuase the Norwegian market is relatively small.

a) Assume that there is no international trade. Analyze this claim in the context of a monopolistic competition model. Compare prices, costs and the number of firms in an industry in both countries. You should explain your reasoning with both words and figures (and/or math).

b) Assume that goods can be traded. How does this affect your results?