Exercises
International Economics

Exercises # 1

1.1 Country A is endowed with 1200 units of labour and can produce two commodities, apples and bananas. The labour requirements per unit of apples are 3 and the labour requirements per unit of bananas are 2. Country B is endowed with 800 units of labour and requires 5 units of labour per unit of apples and 1 unit of labour per unit of bananas.
   (a) Depict the production possibility frontiers of countries A and B.
   (b) Calculate the opportunity costs of apples (in bananas) for countries A and B.
   (c) Construct the relative world supply curve of apples.
   (d) Suppose the relative world demand is as follows: Demand for apples/demand for bananas = Price of bananas/price of apples. Determine the relative price of apples in trade equilibrium and the corresponding trade flows.

1.2 Suppose now that the labour endowment of country A increases from 1200 to 2400 units of labour. Suppose further that the labour productivity falls by one-half in apple production, but remains unchanged in the production of bananas. Construct the relative world supply curve of apples and determine the relative price of apples in equilibrium.

1.3 Country A is endowed with 1200 units of labour and can produce two commodities, apples and bananas. The labour requirements per unit of apples are 3 and the labour requirements per unit of bananas are 2. Country B is endowed with 800 units of labour and requires 5 units of labour per unit of apples and 4 units of labour per unit of bananas.
   (a) Determine the autarky price ratio in country B.
   (b) Depict the transformation curve of country B.
   (c) Is there an international price ratio which allows for mutually beneficial trade and at which 80 apples and 110 bananas can be consumed in country B? Determine numerically and depict graphically country B’s production point and its exports and imports. Determine also the consumption point of country A.

1.4 How can the structure of trade be determined when the Ricardo model of comparative costs is generalized from the case of two commodities to the case of \( n \) commodities? What further complications are caused by the existence of transport costs?

1.5 Explain briefly the meaning and significance of the so-called “gravitation model”.

1.6 In Austria 20 units of labour are required in order to produce one unit of commodity 1 and 5 units of labour are required in the production of commodity 2. In Italy the corresponding labour requirements are 8 units of labour for commodity 1 and 4 units of labour for commodity 2. Austria is endowed with 160 units of labour and Italy with 80 units of labour.
   (a) Determine the autarky price ratios in both countries.
   (b) In which commodity does Italy enjoy a comparative advantage?
   (c) Depict the production possibility frontiers of both countries.
(d) Is there an international price ratio which allows for mutually beneficial trade and at which 4 units of commodity 1 and 20 units of commodity 2 could be consumed in Austria? Determine numerically and depict graphically Austria’s production point and its exports and imports, as well as the consumption point for Italy.

Exercises #2

2.1 “The poorest countries have no commodities they could export. None of the resources is abundant, neither capital nor land, and small poor countries are not even endowed with a large amount of labour.” Discuss this statement.

2.2 Countries A and B use two factors of production, land and labour, in order to produce two commodities, X and Y. Both countries have access to the same technology. Commodity X is land-intensive and country A is relatively labour-abundant. Analyse the effects on the terms of trade and on the welfare in countries A and B, if
(a) the amount of land in country A increases.
(b) the amount of labour in country B decreases.

2.3 Assume that Norway and Sweden trade with each other, with Norway exporting fish to Sweden, and Sweden exporting Volvos to Norway. Norway has a long coastline bordering the North-Atlantic, making it relatively more productive in fishing. Sweden has a greater endowment of capital, making it relatively more productive in automobiles.
(a) Illustrate the gains from trade using the standard trade model, assuming first that tastes for the two commodities are the same in both countries, but that the production possibility frontiers differ.
(b) Due to overfishing Norway becomes unable to catch the same amount of fish as in previous years. This change causes both a reduction in the quantity of fish that can be produced in Norway and an increase in the relative world price for fish, \( P_F/P_A \). Show how the overfishing problem can result in a decline in welfare for Norway.
(c) Show in addition how it is possible that the overfishing problem could result in an increase in welfare for Norway.

2.4 Australia exports machines and imports textiles, while Bangladesh exports textiles and imports machines. Determine the effect on welfare in Bangladesh, if
(a) Australia grants export subsidies to Australian exporters of machines?
(b) Australia imposes an import tariff on textiles?

2.5 In India and in the USA rice and cotton are produced with land and labour. In both countries cotton is always more land-intensive. India is relatively labour-abundant, the USA are relatively land-abundant.
(a) Show the effects of cotton-biased growth in India on relative prices and on relative factor prices in the USA, on the factor input combination and on the amounts produced of the two commodities.
(b) Determine the effects of an American import tariff on the factor price ratio in India.

2.6 Explain the so-called factor price equalization theorem and its significance. What explains that the tendency towards factor price equalization cannot be observed in the empirical data?
Exercises # 3

3.1 Explain the set of assumptions on which the model of monopolistic competition is based. What are the differences between a “monopolistic competitor” and an “oligoplist”?

3.2 In perfect competition firms set price equal to marginal cost. Why can’t firms do this when there are internal economies of scale?

3.3 Explain
   (a) the meaning of “external economies of scale” and possible explanations for their occurrence;
   (b) the difference between “static” and “dynamic” external economies.
   (c) the reason why trade may be associated with welfare losses when there are “external economies of scale”.

3.4 If there are internal economies of scale, why would it ever make sense for a firm to produce the same good in more than one production facility?

3.5 Suppose that country X subsidizes its exports and country Y imposes a “countervailing” tariff that offsets the subsidy’s effect, so that in the end relative prices in country Y are unchanged. What happens to the terms of trade? What about welfare in the two countries? Suppose, on the other hand, that country Y retaliates with an export subsidy of its own. Contrast the results.

3.6 Provide explanations for the fact that countries trade (almost) identical commodities with each other. When and why is such trade welfare-enhancing, when not?

Exercises # 4

4.1 Show how the following transactions affect the Austrian balance of payments:
   (a) An Austrian firm exports military vehicles in the amount of 10 million € to China. In compensation Chinese bicycles in the amount of 7 million € are imported to Austria; for the remaining 3 million € the firm accepts to receive payment in ten years from now.
   (b) The Austrian government grants development aid to some African country in the amount of 1 million €.
   (c) An Austrian tourist visits a restaurant in Tokyo and pays the bill in the amount of 1500 € with his credit card.
   (d) An Austrian buys Chinese bonds for 30.000 €.
   (e) An Austrian scientist sells the rights of his technical patent for 20.000 € to a Korean firm.

4.2 Suppose that domestic (private and public) savings fall short of domestic investment. What does this imply for the balance on current accounts? What does it imply for the balance on capital accounts?

4.3 One US dollar costs 7,5 Norwegian kroners, but only 1,25 Swiss francs. Determine the exchange rate between Norwegian kroners and Swiss francs.

4.4 Explain by means of a simple numerical example of your own choice how an appreciation of the domestic currency affects the expected return of a foreign currency holding.
4.5 Check whether the condition for covered interest parity holds: The interest rate in Austria is 10 percent; in the USA the interest rate is 5 percent. The spot exchange rate is 2 € per US dollar; the forward rate for 12 months is 2,20 € per US dollar. What is the difference in the annual return from investing 1 million Euro in the USA and in Europe? What value would the forward rate have to assume for interest parity to hold?

4.6 (a) The interest rate in the USA is 10 percent; in Europe the interest rate is also 10 percent. The expected future exchange rate is 0,8 € for 1 $. Determine the exchange rate in equilibrium.
(b) Calculate the return in euro of the following investment: An investment of 10,000 $ with a US bank, when the dollar interest rate is 10 percent and the exchange rate increases from 0,8 € for 1 $ to 1 € for 1 $.

Exercises # 5

5.1 Explain the difference between “interest parity” and “real interest parity”. Explain the difference between “absolute purchasing power parity” and “relative purchasing power parity”.

5.2 The price of a Hamburger in Graz is 2,50 €, in Warsaw it costs 6 Zloty. The exchange rate is 4 Zloty for 1 €.
(a) Determine the real exchange rate. Determine the change in the real exchange rate when the Zloty appreciates to 3 Zloty for 1 €.
(b) Explain the assumptions which are required for purchasing power parity to hold.
(c) Show that the real exchange rate cannot change when relative purchasing power parity holds.
(d) The price of a Krainerwurst in Graz is 3€, in Beijing a duck costs 1$. The nominal exchange rate is 1,50 $ for 1 €. What is the price of a Krainerwurst in ducks? How does the price of a Krainerwurst in ducks change, when the US dollar appreciates to 1,25 $ for 1 €?

5.3 Suppose that worldwide all income deriving from interest payments and all gains from exchange rate changes are taxed with a tax rate of $\tau$ percent. How would such a tax affect the interest parity condition?
(a) Set out the usual interest parity condition.
(b) Set out the interest parity condition taking into account the above tax.
(c) What would the interest parity condition have to look like when the tax were imposed only on interest payments but not on gains from exchange rate changes?

5.4 Explain the concepts of nominal and real exchange rates and nominal and real interest parity by answering the following questions:
(a) Is it possible for a currency to simultaneously depreciate in nominal terms and appreciate in real terms? Construct an example.
(b) Is it possible for real interest parity to hold if there is no (nominal) interest parity? Construct an example.

5.5 Explain how the nominal dollar/euro exchange rate would be affected by permanent changes in the expected rate of real depreciation of the dollar against the euro.

5.6 Explain how permanent shifts in national real money demand functions affect real and nominal exchange rates in the long run.