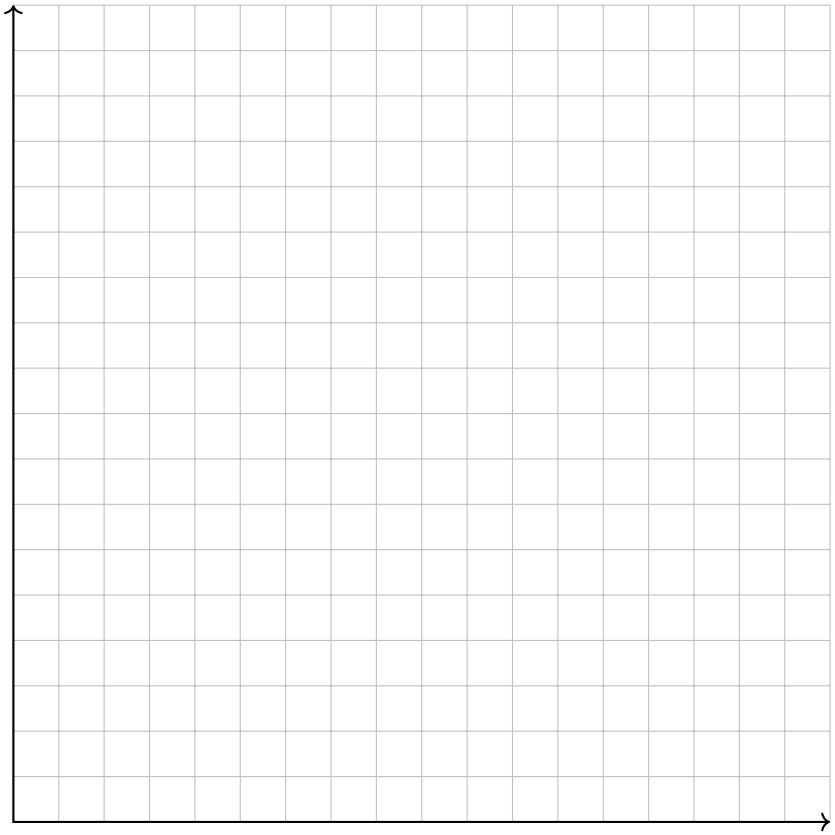
This box is for the examiner only.

Question:	1	2	3	4	5	6	Total
Points:	8	4	6	12	9	6	45
Score:							

1. **Ricardian model**

Consider two countries, $C1$ and $C2$. Country $C1$ has a labor endowment, L, of $L^{C1} = 8$ and country $C2$ has a labor endowment of $L^{C2} = 24$. In both countries, two goods can be produced: y and x. The table below provides the input coefficients, a, for both countries, representing the units of labor needed to produce one unit of each good.

	C1	C2
Good y	0.5	8
Good x	1	12



(a) (4 points) Using the diagram above (ensure to label axes and designate appropriate scales), draw the production possibility frontier (PPF) curves for both countries.

(b) (4 points) Assume now that the countries open up to trade.

i) Name the country with an **absolute** advantage in good x.

ii) Name the country with an **absolute** advantage in good y.

iii) Name the country with a **comparative** advantage in good x.

iv) Name the country with a **comparative** advantage in good y.

Please go on to the next page...

2. (4 points) **[Heckscher Ohlin model]** Given the assumptions of the Heckscher-Ohlin Model, let's consider a scenario involving only two countries, C3 and C4, and two goods, c and d. It is assumed that good c is capital-intensive in its production, whereas good d is labor-intensive. Given the endowments in the table below, name the comparative advantages of the two countries. Briefly discuss your decision.

	Factor Endowments	
Countries	Labor Force	Capital Stock
C3	200	30
C4	500	400

3. (6 points) **[Trade Policy (Ricardian model)]**

   Given the assumptions of the Ricardo model, consider two countries: $C5$ and $C6$. These countries are equally endowed with the only production factor labor. In both countries, two goods can be produced: e and f. The table below provides the input coefficients, a, for both countries, representing the units of labor needed to produce one unit of each good.

	Good e	Good f
$C5$	2	10
$C6$	10	200

   Discuss the international competitiveness of country $C6$ within the Ricardian model. Do you think that country $C6$ will successfully export a good to $C5$ and if so, which good do you think can it export? Explain your decision briefly.

4. (12 points) **[Monetary International Economics]**

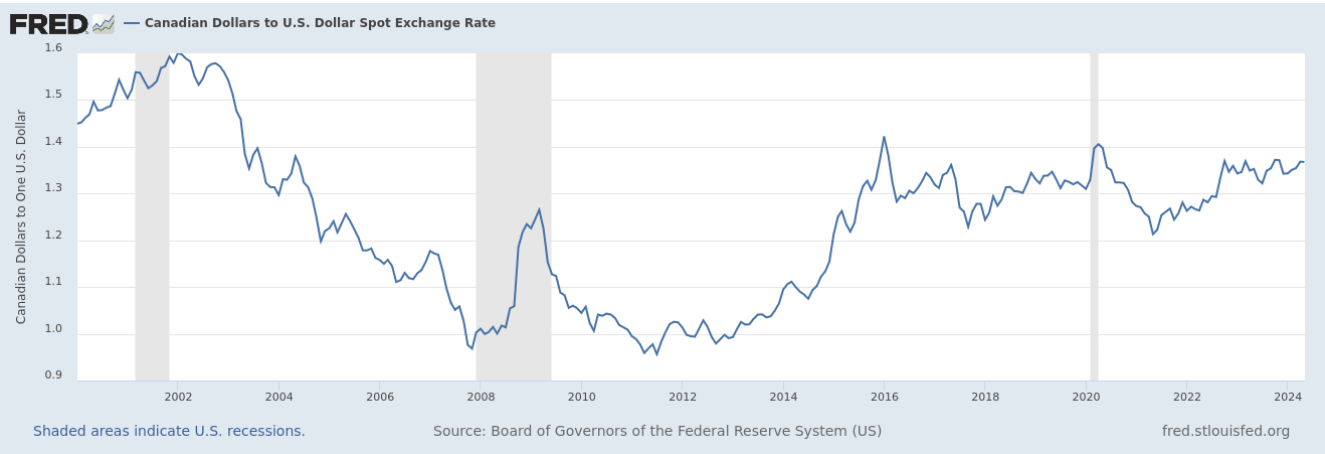


Figure 1: Canadian Dollars to U.S. Dollar Exchange Rate

Figure 1 represents the Canadian Dollars to U.S. Dollar Spot Exchange Rate.

(a) Today, 1 United States Dollar (USD) equals about 1.38 Canadian Dollar (CAD). Since January 2002, has the USD depreciated or appreciated against the CAD? Explain your decision.

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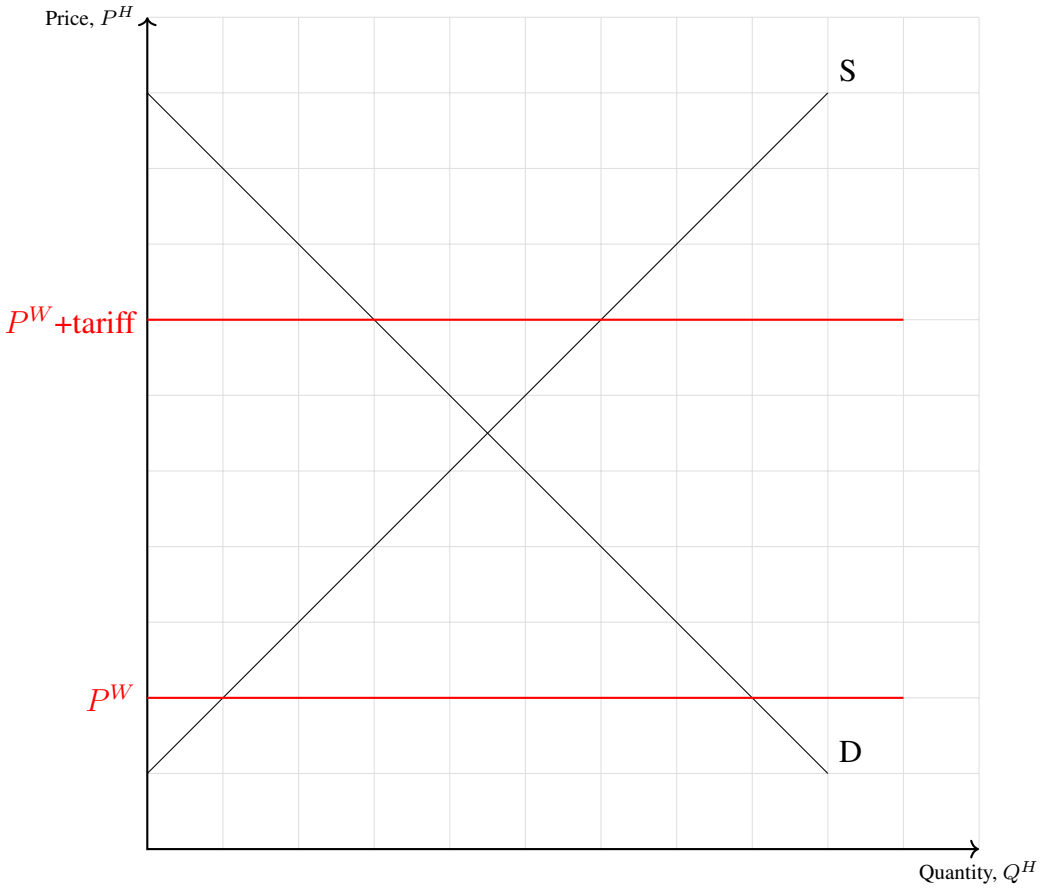
(b) Assume that in January 2002, you exchanged a total of 2000 USD to Canadian Dollars (CAD) at a rate of 1.6 CAD per USD. Calculate how much that amount is worth today in USD.

(c) Suppose you have 1000 USD today and plan to invest it in a Canadian fund that assures you a 2% annual interest rate. Calculate how much USD you'll have after one year if the exchange rate changes slightly to 1.632 CAD per USD. Assume there is no inflation in either Canada or the United States.

5. (9 points) **[Tariff policy in a small open economy]**

   The following figure contains—for a small open economy—the domestic supply and demand curves for a certain good, x, and the world market price, p^W.

   Use the diagram below to discuss the economic implications of a tariff, t, for a small open economy. In particular, discuss the producer and consumer surplus, as well as the overall welfare before and after the introduction of the tariff. Discuss briefly whether the introduction of the tariff is has improved the welfare of this small open economy.



6. (6 points) **[Balance of payments]** In the lecture, we used a formal representation to explain that net capital outflow must equal net exports. Additionally, we watched a short video featuring Marcel Fratzscher and Clemens Fuest discussing Germany's trade surplus and how to reduce it. Briefly discuss the suggestions they proposed to decrease Germany's net export surplus.

References

End of exam

This box is for the examiner only.

Question:	1	2	3	4	5	Total
Points:	16	4	6	8	11	45
Score:						

1. **Ricardian model**

Consider two countries, A and B. Country A has a labor endowment, L, of

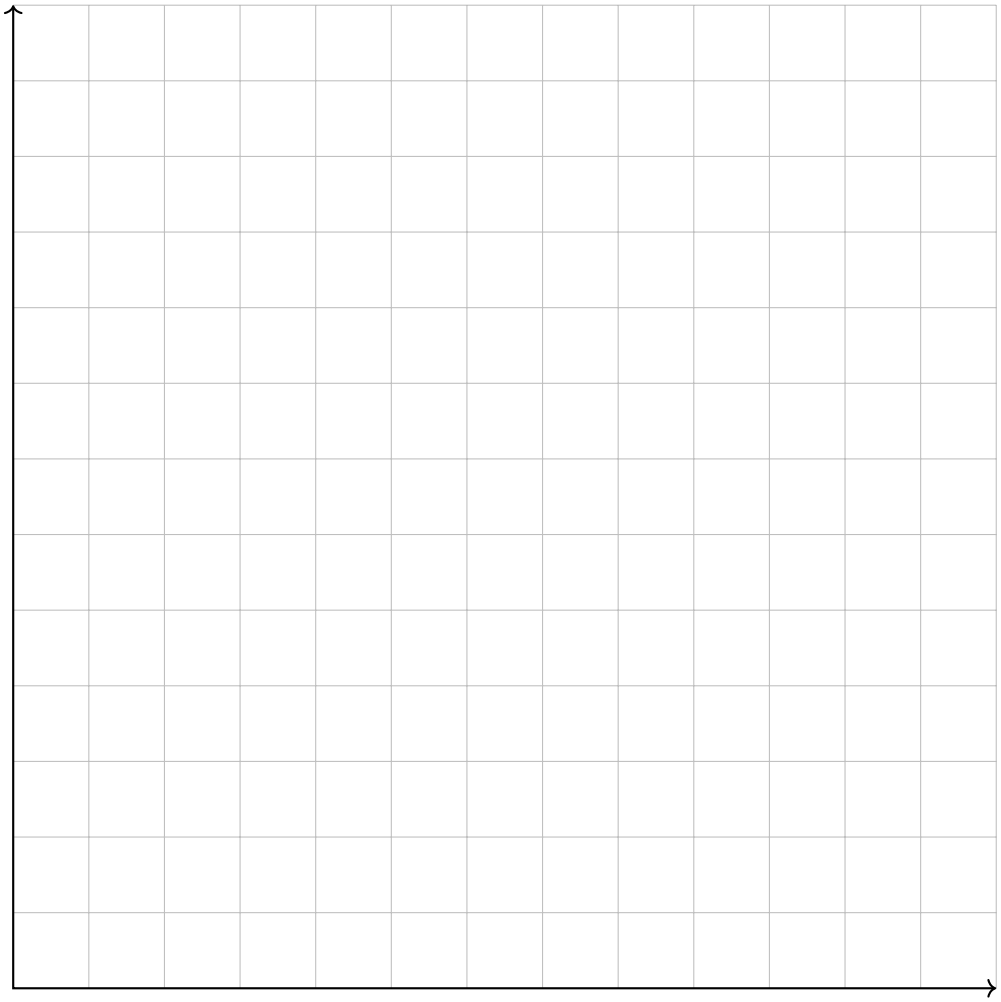
$$L^A = 12$$

and country B has a labor endowment of

$$L^B = 24.$$

In both countries, two goods can be produced: cars, denoted by y, and car tires, denoted by x. It is assumed that these two goods can only be consumed in bundles consisting of one car and four car tires. The table below provides the input coefficients, a, for both countries, representing the units of labor needed to produce one unit of each good.

	A	B
Good y (cars)	6	8
Good x (car tires)	1	4



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(a) (4 points) Calculate the maximum number of cars and tires that each country can produce if all its available labor is employed in the production of only one good.

(b) (4 points) Using the diagram above (ensure to label axes and designate appropriate scales), draw the production possibility frontier (PPF) curves for both countries in a state of autarky, where country A and B do not engage in trade.

(c) (2 points) Determine how many complete cars (bundles of one car and four tires) each country can consume in autarky.

(d) (6 points) Assume now that the countries open up to trade.

i) Name the country with an **absolute** advantage in good x.

ii) Name the country with an **absolute** advantage in good y.

iii) Name the country with a **comparative** advantage in good x.

iv) Name the country with a **comparative** advantage in good y.

v) Discuss how many of each good x and y each country is producing, exporting, and importing when trade is allowed and no transportation costs exist.

2. (4 points) **[Heckscher Ohlin model]** Given the assumptions of the Heckscher-Ohlin Model, let's consider a scenario involving only two countries, C and D, and two goods, y and x. It is assumed that good y is capital-intensive in its production, whereas good x is labor-intensive. Given the endowments in the table below, name the comparative advantages of the two countries. Briefly discuss your decision.

	Countries	
Factor Endowments	C	D
Labor Force	200	30
Capital Stock	500	400

3. (6 points) **[Trade Policy]**

Suppose you serve as the economic advisor to the President of country XYZ. The President has requested you to review a first draft of their upcoming speech. Below is an excerpt from the speech:

> *"To enhance our competitiveness in global markets and ensure our ability to export, it is imperative that we focus on training our workforce to boost productivity. Without such efforts, we risk being unable to engage in any trade at all."*

Critically evaluate this statement by drawing upon the trade theories discussed in our lectures. Provide feedback to the President, highlighting any misconceptions or oversimplifications. Pay particular attention to the claim that a lack of workforce training could lead to an inability to engage in trade.

4. (8 points) **[Monetary International Economics]**

Suppose you have 50,000 Indian Rupees (INR) this year that you want to invest for one year from t to $t+1$ and then buy something with the Indian Rupees in India. Calculate the return on an investment in India and Germany, given the following conditions:

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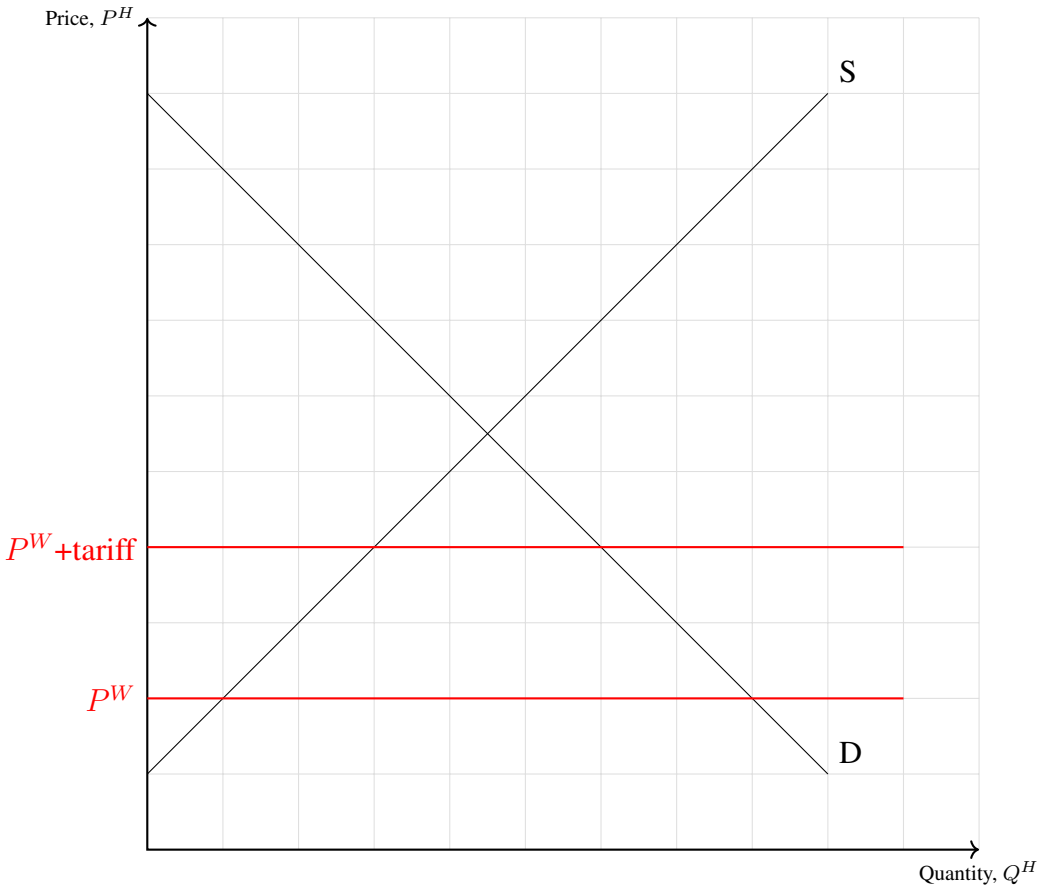
- The annual interest rate in India is 5% and 2% in Germany.
- 1 INR can be converted to 0.01 Euro (EUR) this year, t.
- You expect the Indian Rupee to depreciate, that is, you expect 1 EUR to cost 1 INR more next year, that is $t + 1$.
- Moreover, you expect no inflation in India and Germany.

5. (11 points) **[Tariff policy in a small open economy]**

   The following figure contains—for a small open economy—the domestic supply and demand curves for a certain good, x, and the world market price, p^W.

   Use the diagram below to discuss the economic implications of a tariff, t, for a small open economy. In particular, discuss the producer and consumer surplus, as well as the overall welfare before and after the introduction of the tariff. Additionally, mark in the figure the quantity of good x that is traded by the small economy with and without a tariff. Discuss briefly whether the introduction of the tariff is has improved the welfare of this small open economy.



References

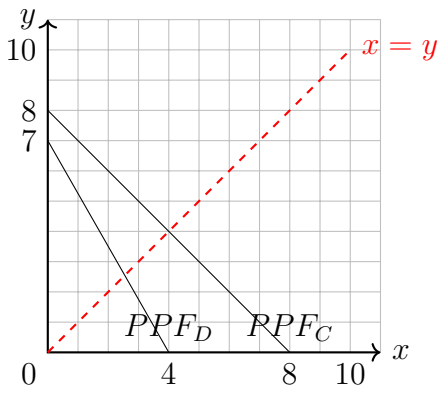
End of exam

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	4	10	20	11	45
Score:					

1. (4 points) **[Ricardian model]**

   Assume that only two countries, C and D, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The figure below gives the production possibility frontier curves (PPF) for both countries C and D.



   i) Name the country with an **absolute** advantage in good x.

   ii) Name the country with an **absolute** advantage in good y.

   iii) Name the country with a **comparative** advantage in good x.

   iv) Name the country with a **comparative** advantage in good y.

2. **[Ricardian model]**

Consider two countries, A and B. Both have a labor endowment of 24, $L^A = L^B = 24$. In both countries two goods can be produced, bikes, which are denoted by y, and bike tires, which are denoted by x. The table below gives—for both countries—the input coefficients, a, i.e., the units of labor needed to produce one unit of good y and good x, respectively.

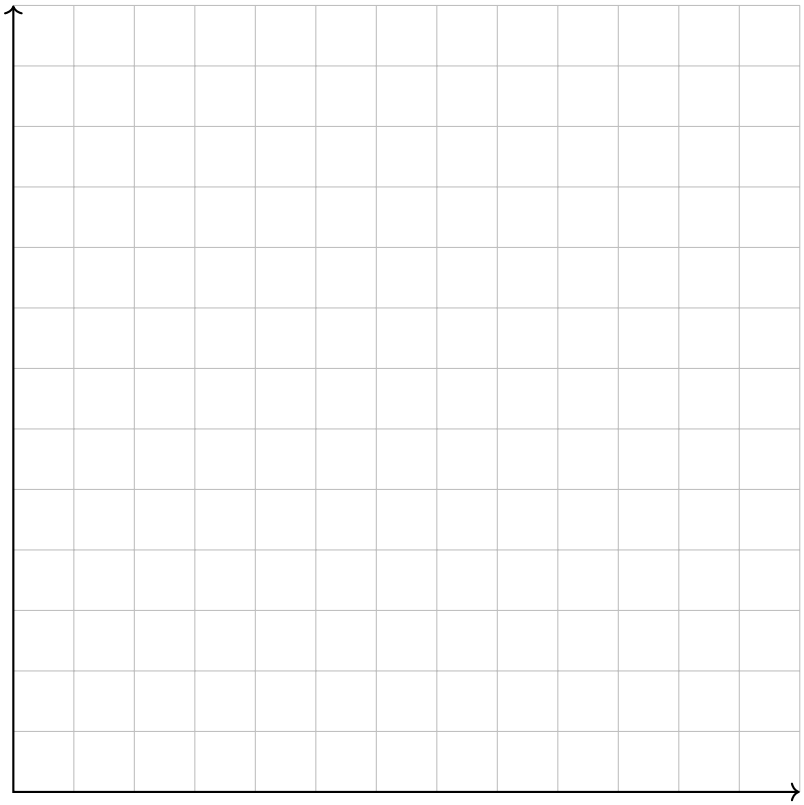
	Countries	
	A	B
Good y (bikes)	4	8
Good x (bike tires)	4	2

Assume that the two goods can only be consumed in bundles of one bike and two bike tires.

(a) (4 points) Use the diagram below for the following:

- Draw the production possibility frontier curves for both countries in autarky, i.e, country A and B do not trade with each other.
- Draw the consumption and production points for country A and B.

Additionally, discuss how many complete bikes (1 bike and 2 tires) are produced and consumed in country A and country B, respectively.



(b) (6 points) Assume that the two countries agree on a free trade agreement. Discuss the new production points and the trade structure under free trade. Additionally, discuss how many complete bikes each country can consume under free trade.

3. **[Monetary International Economics]**

   (a) (10 points) In the lecture we have shown that the equation

   $$I_t = I_{t-1} \cdot (1+i) \cdot E^{\frac{₺}{€}}_{t-1} \cdot E^{\frac{€}{₺}}_t$$

   can be re-written with

   $$r = w + i + iw.$$

   - Define and explain in detail what r, w, and i stand for.
   - When is w a positive number?
   - What is the *simple rule for r*?

   (b) (3 points) The *Purchasing Power Parity Assumption*, a.k.a. the *law of one price* predicts that identical goods should have the same price across countries when expressed in terms of the same currency. However, we often do observe price differences. Why? Discuss.

   (c) (7 points) Suppose 1 US Dollar (USD) is equivalent to 1.20 Euros (EUR).

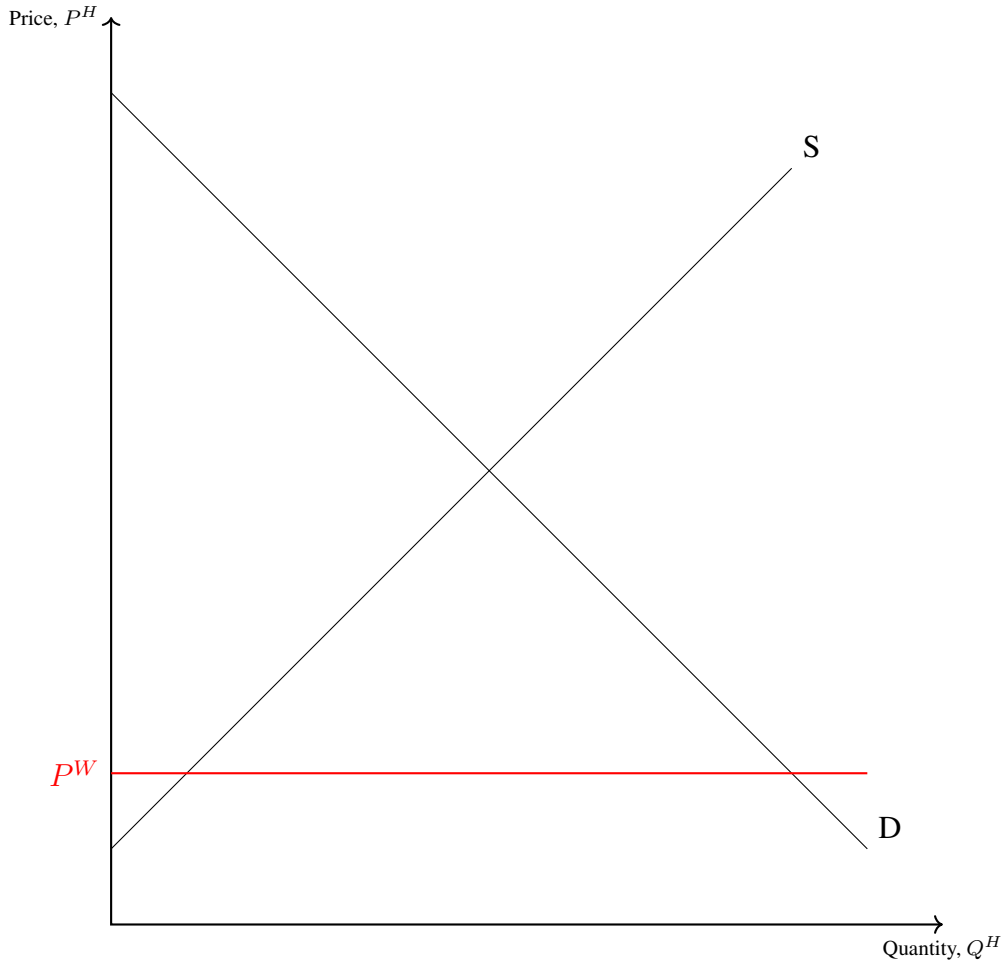
   - Calculate the equivalent amount in Euros if a person exchanges 500 US Dollars.
   - If the exchange rate changes to $1.15\frac{USD}{EUR}$, recalculate the equivalent amount in Euros for the same 500 US Dollars.
   - If the exchange rate changes to $1.15\frac{USD}{EUR}$, has the Euro appreciated or depreciated?
   - A European tourist plans to spend 1,000 Euros during a trip to the United States. Calculate the equivalent amount in US Dollars at the exchange rate of $1.15\frac{EUR}{USD}$.

Please go on to the next page...

4. (11 points) **[Tariff policy in a small open economy]**

   The following figure contains—for a small open economy—the domestic supply and demand curves for a certain good, x, and the world market price, p^W.

   Use the diagram below to discuss the economic implications of a tariff, t, for a small open economy. Assume thereby that the tariff is not prohibitively high so that the country remains an importer of good x after the introduction of the tariff. In particular, discuss the producer and consumer surplus, as well as the overall welfare before and after the introduction of the tariff. Additionally, mark in the figure the quantity of good x that is traded by the small economy with and without a tariff.



References

End of exam

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	15	14	6	10	45
Score:					

1. **[Monetary International Economics]**

   (a) (10 points) Explain what the following *simple rule for* r can teach us:

   $$r = w + i.$$

   In particular, explain what r, w, and i stand for. When is w a positive number? Why is is called 'simple' rule?

   (b) (3 points) Price differences across countries can be illustrated with the *Big Mac Index*. It measures the price of a Big Mac in different countries expressed in terms of the US-Dollar. Here is an excerpt of the index:

Country	Price of 1 Big Mac	Price of 1 Big Mac
Germany	\$ 4.70	EUR 3.88
Swizerland	\$ 6.90	CHF 6.16
United States of America	\$ 5.70	

   With the information given in the table, calculate the exchange rate of Euros (EUR) to Swiz Franc (CHF).

   (c) (2 points) Suppose you have €100 and you want to exchange it into Swiss Franc (CHF). Calculate how much CHF you receive for your €100 when the exchange rate is 0.92 denoted in Swiss Franc to Euro.

2. **[Ricardian model]**

   (a) (4 points) Assume that only two countries, A and B, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The table below gives the input coefficients, a, for both countries, i.e., the units of labor needed to produce one unit of good y and good x, respectively. Assume that both countries have 12 units of labor available.

	x	y
B	4	25
A	12	3

   i) Name the country with an **absolute** advantage in good x.

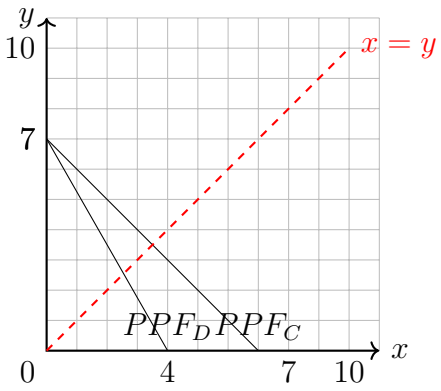
   ii) Name the country with an **absolute** advantage in good y.

   iii) Name the country with a **comparative** advantage in good x.

   iv) Name the country with a **comparative** advantage in good y.

   (b) (10 points) Assume that only two countries, C and D, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The figure below gives the production possibility frontier

curves (PPF) for both countries C and D. Assume further that the two goods are perfect substitutes, i.e., they needed to be consumed in a fixed ration of 1:1.



i) Name the country with an **absolute** advantage in good x.

ii) Name the country with an **absolute** advantage in good y.

iii) Name the country with a **comparative** advantage in good x.

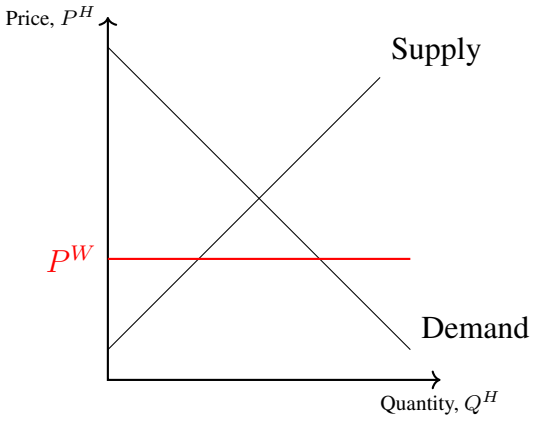
iv) Name the country with a **comparative** advantage in good y.

v) Discuss how many of each good x and y each country is producing, exporting, and importing when trade is allowed and no transportation costs exist.

3. (6 points) **[Trade policy]**

   Explain briefly the infant industry argument.

4. (10 points) **[Export/Import]** Suppose there is a small open economy that can buy and sell goods at the world market price, P^W, as is shown in the diagram below. Now, assume the rest of the world wants to close all borders to the small open economy such that international trade is not possible anymore for the small economy. Discuss implications concerning consumer surplus, producer surplus, overall welfare, and market price when the rest of the world would close borders, i.e., the small country would be in autarky.



End of exam

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	15	14	10	6	45
Score:					

1. **[Ricardian model]**

   (a) (5 points) Assume that only two countries, A and B, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The table below gives the input coefficients, a, for both countries, i.e., the units of labor needed to produce one unit of good y and good x, respectively. Assume that both countries have 12 units of labor available.

	x	y
B	24	25
A	12	13

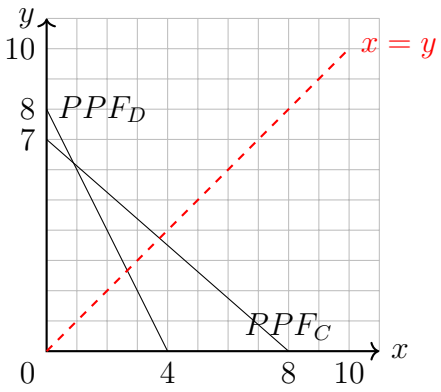
   i) Name the country with an **absolute** advantage in good x.

   ii) Name the country with an **absolute** advantage in good y.

   iii) Name the country with a **comparative** advantage in good x.

   iv) Name the country with a **comparative** advantage in good y.

   (b) (10 points) Assume that only two countries, C and D, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The figure below gives the production possibility frontier curves (PPF) for both countries C and D. Assume further that the two goods are perfect complements, i.e., they needed to be consumed in a fixed ration of 1:1.



   i) Name the country with an **absolute** advantage in good x.

   ii) Name the country with an **absolute** advantage in good y.

   iii) Name the country with a **comparative** advantage in good x.

   iv) Name the country with a **comparative** advantage in good y.

   v) Discuss how many of each good x and y each country is producing, exporting, and importing when trade is allowed and no transportation costs exist.

2. **[International Investments]**

Please go on to the next page...

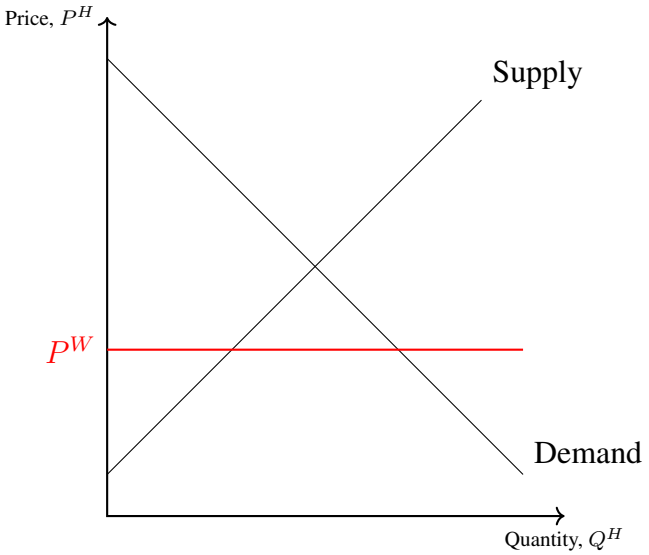
(a) (8 points) Explain in great detail the *simple rule for r* that we have discussed in the lecture at length.

(b) (6 points) Suppose you have €100 this year that you want to invest for one year and then buy something with the €.

Calculate the return on an investment in the United States of America and the European Union, given the following conditions:

- The annual interest rate in Europe is 8%.
- The annual interest rate in the U.S.A. is 10%.
- \$1 can be converted to €0.95 this year.
- You expect that €1 can be converted to \$ 1 next year.
- Moreover, you expect no inflation in Germany and the U.S.

3. (10 points) **[Export/Import]** Suppose there is a small open economy that can buy and sell goods at the world market price, P^W, as is shown in the diagram below. Now, assume the rest of the world wants to close all borders to the small open economy such that international trade is not possible anymore for the small economy. Discuss implications concerning consumer surplus, producer surplus, overall welfare, and market price when the rest of the world would close borders, i.e., the small country would be in autarky.



4. (6 points) **[Trade policy]**

Explain briefly the infant industry argument.

End of exam

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	15	16	6	8	45
Score:					

1. **[Ricardian model]**

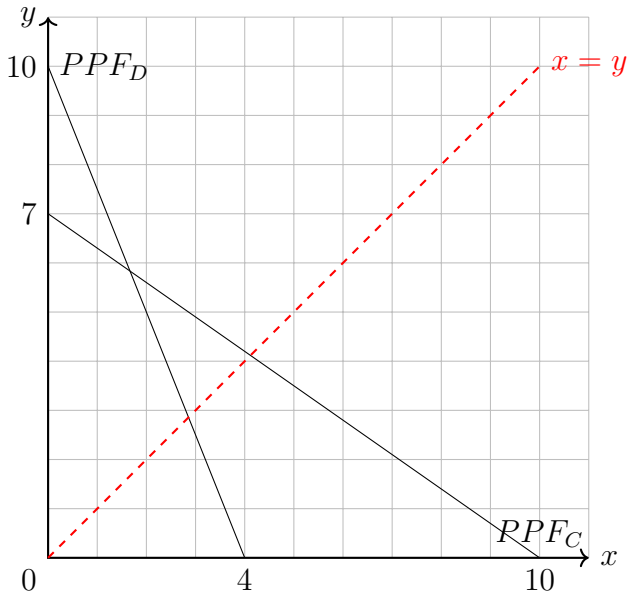
   (a) (5 points) Assume that only two countries, A and B, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The table below gives the input coefficients, a, for both countries, i.e., the units of labor needed to produce one unit of good y and good x, respectively. Assume that both countries have 12 units of labor available.

	Countries	
	A	B
Good y	24	25
Good x	12	13

   i) Name the country with an **absolute** advantage in good y and good x, respectively.

   ii) Name the country with a **comparative** advantage in good y and good x.

   (b) (10 points) Assume that only two countries, C and D, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The figure below gives the production possibility frontier curves (PPF) for both countries C and D. Assume further that the two goods are perfect substitutes, i.e., they needed to be consumed in a fixed ration of 1:1.



   i) Name the country with an **absolute** advantage in good y and good x, respectively.

   ii) Name the country with a **comparative** advantage in good y and good x.

   iii) Discuss how many of each good x and y each country is producing, exporting, and importing when trade is allowed and no transportation costs exist.

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2. **[International Investments]**

   (a) (8 points) In early 2015 the exchange rate of the Swiss Franc to the Euro, $E^{\frac{CHF}{€}}$ and interest rates in Switzerland changed significantly.

      i) Explain briefly what event caused these changes.

      ii) Explain what is the *interest parity condition*.

      iii) Explain the relationship of the two variables using the *interest parity condition*.

   (b) (8 points) Suppose you have €100 this year that you want to invest for one year and then buy something with the €.

   Calculate the return on an investment in the United States of America and the European Union, given the following conditions:

   - The annual interest rate in Europe is 10%.
   - The annual interest rate in the U.S.A. is 20%.
   - \$1 can be converted to €1 this year.
   - You expect that €1 can be converted to \$0.80 next year.
   - Moreover, you expect no inflation in Germany and the U.S.

3. (6 points) **[Heckscher Ohlin model]**

   (a) Discuss briefly the main differences of the Ricardian Model and the Heckscher-Ohlin Model.

   (b) Given are the assumptions of the Heckscher-Ohlin Model. In particular, assume that only two countries, A and B, and two goods, y and x, exist. Further assume that good y is capital intensive in production and good x is labor intensive in production. Given the endowments in the table below, name the comparative advantages and the trade structure between these two countries.

	Countries	
Factor Endowments	A	B
Labor Force	2	20
Capital Stock	3	40

4. (8 points) **[Trade policy]**

   Explain the basic principles of the World Trade Organization.

End of exam

This box is for the examiner only.

Question:	1	2	3	4	5	Total
Points:	10	13	8	4	10	45
Score:						

1. (10 points) **[Balance of payments]** Provide a detailed explanation of the meaning of the equation $NCO = NEX$ as discussed in the lecture, including a formal derivation of the equation. Referring to the equation, discuss the suitability of using a trade surplus or a trade deficit as an indicator of international competitiveness for countries.

2. **[International investment]**

   (a) (5 points) Provide an explanation of the *simple rule for r* in international economics.

   (b) (8 points) Suppose you have €1000 this year that you want to invest for one year and then buy something with the €.

   Calculate the return on an investment in the United States of America and the European Union, given the following conditions:

   - The annual interest rate in Europe is 5%.
   - The annual interest rate in the U.S.A. is 8%.
   - $1.10 can be converted to €1 this year.
   - You expect that €1 can be converted to $1.20 next year.
   - Moreover, you expect no inflation in Germany and the U.S.

3. (8 points) **[Ricardian model]**

   Suppose there are two countries, A and B, and two goods, X and Y. The production of each good requires only one input, labor. The following table shows the number of units of labor required to produce one unit of each good in each country:

	Good X	Good Y
Country A	5 labor units	2 labor units
Country B	6 labor units	3 labor units

   (a) Which country has an absolute advantage in producing good X and Y, respectively?

   (b) Country B exports good X to country A and country A exports good Y to country B. Explain that trade pattern in detail using the Ricaridan theory and opportunity costs.

4. (4 points) **[Heckscher Ohlin model]**

   The Heckscher-Ohlin Model is based on nine assumptions of which some are given below. Identify and explain the missing assumptions.

   1. **Goods differ in terms of their need for factors of production**: $\frac{K_y}{L_y} \neq \frac{K_x}{L_x}$.
   This means that one good must be produced in a capital-intensive way and the other in a labor-intensive way. If we assume that good y is capital intensive and good x is labor intensive in production, we can write: $\frac{K_y}{L_y} > \frac{K_x}{L_x}$.

   In this inequality, the quantity of capital required to produce good y, K_y, is on the left-hand side relative to the quantity of labor required to produce good y, L_y, i.e., the

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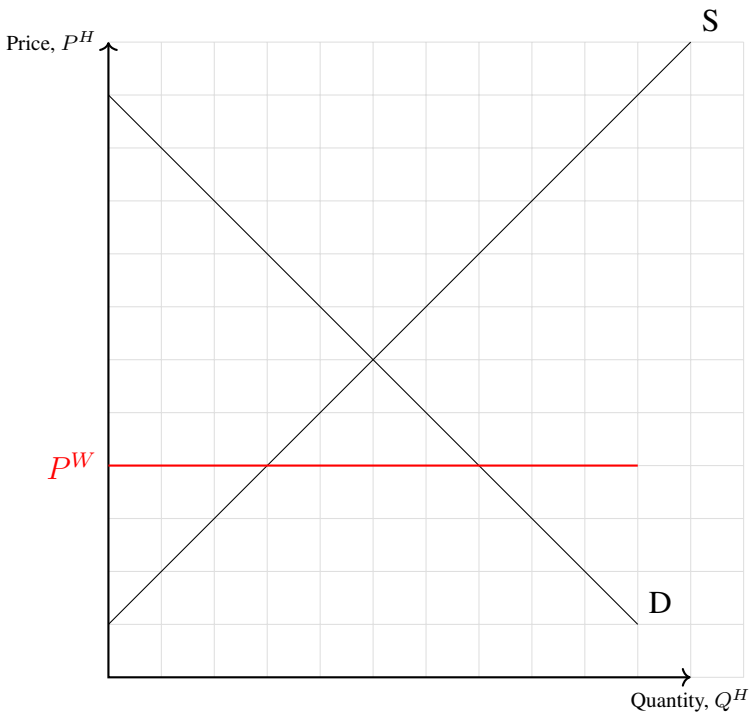
capital intensity of good y.The capital intensity of good x is on the right-hand side of the inequality.

2. **Different relative factor endowments**: $\frac{K}{L} \neq \frac{K^*}{L^*}$
   Since countries are assumed to have different factor endowments, the model links a country's trade pattern to its endowment of factors of production. The capital-labor ratio in the home country, $\frac{K}{L}$, must differ from the ratio abroad. $\frac{K}{L} > \frac{K^*}{L^*}$.
3. **Free factor movement between sectors** Both factors can be used in the production of both goods. Note that cross-country movement of factors (migration, foreign direct investment) is not allowed.
4. **Equal tastes in countries and homothetic preferences** Consumers in both countries have the same utility function. Homothetic preferences simply mean that for given relative prices, income does not affect the ratio of consumption.
5. **No trade costs** Final products can be traded without any costs.

5. (10 points) **[Trade policy]** The following diagram depicts the supply and demand scheme for a given good in a small open economy, where $P^W = 4$ denotes the world market price.
   (a) What will be the equilibrium market price?
   (b) Sketch producer and consumer surplus in the diagram below.
   (c) What is the total welfare in a free and open market?
   (d) Is this country an exporter or an importer of that particular good? Sketch the exports/imports in the diagram. (Note: No calculations required!)
   (e) What would happen to the equilibrium market price in that country, to consumer surplus, to producer surplus, and to total welfare if the government would introduce a tariff on that good.



End of exam

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	14	5	18	8	45
Score:					

1. **[Comparative advantage]**

   (a) (8 points) State the assumptions on which the Ricardian model is based.

   (b) (6 points) Suppose that there are only two countries, A and B. Both countries are equally endowed with the single factor of production, labor, which can be used to produce either good y or good x. The following table shows the input coefficients a for both countries, i.e., the units of labor needed to produce one unit of good y or good x.

Good:	y	x
Country A	48	36
Country B	46	32

   - Which country has an absolute advantage in producing good y and x, respectively?
   - With reference to comparative advantage, explain the trade structure of these two countries.

2. (5 points) **[Heckscher Ohlin model]**

   The Heckscher-Ohlin Model is based on nine assumptions of which four are given below. Explain the missing assumptions.

   1. **Goods differ in terms of their need for factors of production**: $\frac{K_y}{L_y} \neq \frac{K_x}{L_x}$.
      This means that one good must be produced in a capital-intensive way and the other in a labor-intensive way. If we assume that good y is capital intensive and good x is labor intensive in production, we can write: $\frac{K_y}{L_y} > \frac{K_x}{L_x}$.

      In this inequality, the quantity of capital required to produce good y, K_y, is on the left-hand side relative to the quantity of labor required to produce good y, L_y, i.e., the capital intensity of good y.The capital intensity of good x is on the right-hand side of the inequality.

   2. **Different relative factor endowments**: $\frac{K}{L} \neq \frac{K^*}{L^*}$
      Since countries are assumed to have different factor endowments, the model links a country's trade pattern to its endowment of factors of production. The capital-labor ratio in the home country, $\frac{K}{L}$, must differ from the ratio abroad. Suppose the home country is capital-rich and the foreign country is labor-rich. Then we have the following ratios between capital and labor in the two countries: $\frac{K}{L} > \frac{K^*}{L^*}$.

   3. **Free factor movement between sectors** Both factors can be used in the production of both goods. Note that cross-country movement of factors (migration, foreign direct investment) is not allowed.

   4. **Equal tastes in countries and homothetic preferences** Consumers in both countries have the same utility function. Homothetic preferences simply mean that for given relative prices, income does not affect the ratio of consumption.

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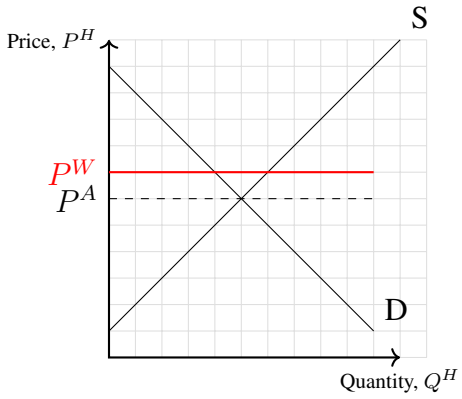
3. **[Trade policy]**

   (a) (8 points) The World Trade Organization agreements contain a wide range of rules. They are all based on some basic principles. Briefly explain these principles.

   (b) (10 points) The following diagram depicts the supply and demand scheme for a given good in a small open economy, where P^W denotes the world market price. Discuss producer surplus, consumer surplus, and total welfare, as well as the country's exports or imports. Use the diagram below for your explanations. (Note: No calculations required!)



4. (8 points) **[International investment]**

   Suppose you have €1000 this year that you want to invest for one year in the United States of America and then buy something with the €in the European Union.

   a) Calculate the expected return on your investment, given the following conditions:

   - The annual interest rate in the U.S.A. is 2%.
   - \$1.10 can be converted to €1 this year.
   - You expect that €1 can be converted to \$1.05 next year.
   - Moreover, you expect no inflation in the U.S.A.

   b) Discuss whether you expect the € to appreciate or to depreciate.

End of exam

This box is for the examiner only.

Question:	1	2	3	4	5	6	7	Total
Points:	5	3	7	10	6	8	6	45
Score:								

1. (5 points) **[Ricardian trade theory]** Suppose that there are only two countries, y and x. Both countries are equally endowed with the single factor of production, labor, which can be used to produce either good A or good B. The following table shows the input coefficients a for both countries, i.e., the units of labor needed to produce one unit of good A or good B.

Country:	y	x
Good A	489	362
Good B	329	468

   (a) Which country has an absolute advantage in producing good y and x, respectively?

   (b) With reference to comparative advantage, explain the trade structure of these two countries.

2. (3 points) **[Heckscher Ohlin model]**

   Given are the assumptions of the Heckscher-Ohlin Model. In particular, assume that only two countries, C and D, and two goods, x and y, exist. Consider the following factor endowments:

	Countries	
Factor Endowments	C	D
Labor Force	300	30
Capital Stock	201	20

   Referring to the Heckscher-Ohlin theorem, state which country will export or import the capital-intensive good y and the labor-intensive good x.

3. (7 points) **[Purchasing power parity assumption]** What is the claim of the purchasing power parity assumption? Discuss the intuition behind this assumption.

4. **[Trade policy]**

   (a) (4 points) Briefly explain why some politicians think that international trade can be seen as a form of diplomacy.

   (b) (6 points) Explain briefly the basic principles of the World Trade Organization (WTO).

5. (6 points) **[Balance of payments]**

   The equation

$$Y = C + I + G + EX - IM$$

   is often used to describe an open economy. Use this representation to explain why net exports must equal net capital outflows.

6. **[Exchange rates (1)]**

   Suppose you want to buy a new PC in Germany in one year, i.e, t=2023. Today, i.e., t=2022, you have €1,000 to invest for one year.

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Given the following conditions:

- The annual interest rate in Europe is 2%.
- The annual interest rate in the U.S.A. is 4%.
- One US-Dollar can be converted to €0.96 this year.
- You expect that €1 can be converted to $0.80 next year.
- Moreover, you expect no inflation in Germany and the U.S.
- No banking fees or alike.

(a) (6 points) Calculate the return on an investment in the U.S. and Germany, respectively.

(b) (2 points) Do you expect the euro to appreciate or depreciate from 2022 to 2023?

7. (6 points) **[Exchange rates (2)]**

Figure 1 shows the development of Euro in US-Dollar ($E^{\frac{\$}{€}}$) the exchange rate over the last year. Discuss what the drop of more than 17% in the excange rate implies for companies and consumers in both countries. Discuss who has benefited from this development and who is rather unhappy about it.

Figure 1: Euro in US-Dollar from 09-2021 to 09-2022
Source: Google Finanzen

References

End of exam

This box is for the examiner only.

Question:	1	2	3	4	5	6	7	Total
Points:	5	3	8	5	8	8	8	45
Score:								

1. (5 points) **[Ricardian Trade Theory]** Suppose that there are only two countries, A and B. Both countries are equally endowed with the single factor of production, labor, which can be used to produce either good y or good x. The following table shows the input coefficients a for both countries, i.e., the units of labor needed to produce one unit of good y or good x.

Good:	y	x
Country A	489	362
Country B	468	329

   (a) Which country has an absolute advantage in producing good y and x, respectively?

   (b) With reference to comparative advantage, explain the trade structure of these two countries.

2. (3 points) **[Heckscher Ohlin Model]**

   Given are the assumptions of the Heckscher-Ohlin Model. In particular, assume that only two countries, A and B, and two goods, y and x, exist. Consider the following factor endowments:

	Countries	
Factor Endowments	A	B
Labor Force	30	30
Capital Stock	20	10

   Referring to the Heckscher-Ohlin theorem, state which country will export or import the capital-intensive good y and the labor-intensive good x.

3. (8 points) **[Factor-Price Equalization Theorem]** The Factor-Price Equalization Theorem says that the prices of the two factors of production (wage and rent) will be equalized across countries as a result of international trade in goods.

   a) Explain in detail why the theorem can be derived from in the Heckscher Ohlin Model.

   b) Discuss why it is not possible to observe a perfect equalization of factor prices between trading partners.

4. (5 points) **[Trade Policy]** Discuss what Boris Johnson means when he claims that *free trade is god's diplomacy*.

5. (8 points) **[Balance of payments]**

   (a) Explain why net exports must equal net capital outflows using the *formal representation*.

   (b) Which of the following countries has a trade surplus: China, Germany, the United States of America, and Russia?

Please go on to the next page...

6. **[Exchange rates]**

   Suppose you want to buy a new car in Germany in one year, i.e, t=2023. Today, i.e., t=2022, you have €10,000 to invest for one year.

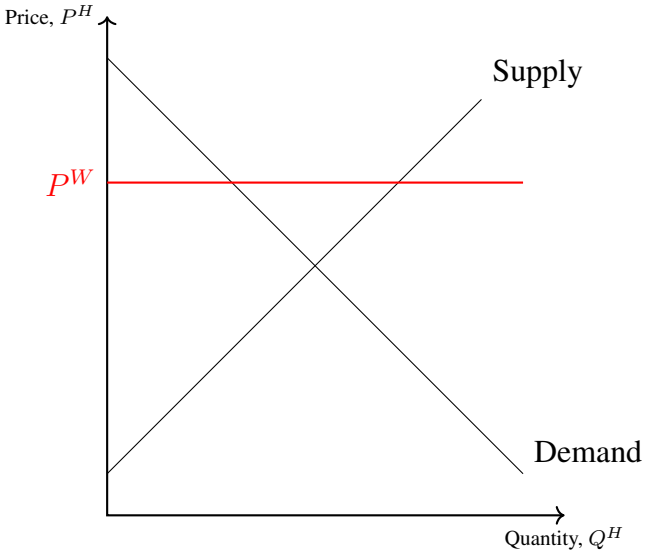
   Given the following conditions:

   - The annual interest rate in Europe is 1%.
   - The annual interest rate in the U.S.A. is 2%.
   - One US-Dollar can be converted to €0.93 this year.
   - You expect that €1 can be converted to $1.09 next year.
   - Moreover, you expect no inflation in Germany and the U.S.
   - No banking fees or alike.

   (a) (6 points) Calculate the return on an investment in the U.S. and Germany, respectively.

   (b) (2 points) Do you expect the euro to appreciate or depreciate from 2022 to 2023?

7. (8 points) **[Export/Import]** Suppose there is a small closed economy that can neither export nor import at the world price P^W, as shown in the following diagram. Discuss what would happen to consumer surplus, producer surplus, total welfare, and market price if the small country decided to open up to foreign markets. Use the diagram for your answer.

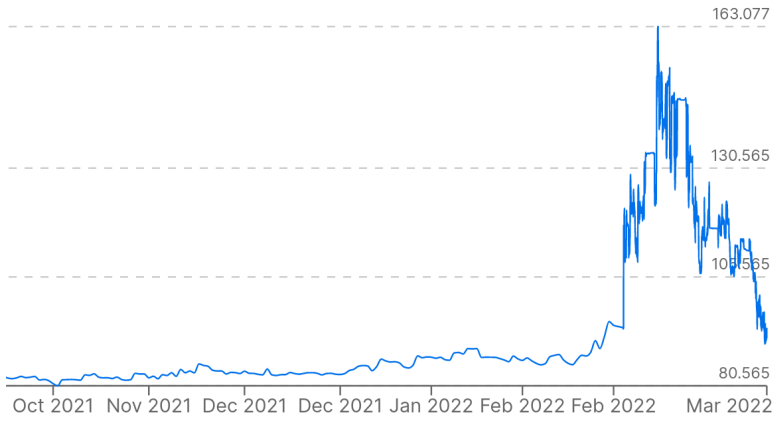


End of exam

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	12	5	4	24	45
Score:					

1. **[Exchange rates]**



   (a) (8 points) In the figure above, you see the exchange rate of the Russian Ruble in relation to the Euro. Unfortunately the y-axis is not labeled. Please discuss whether the exchange rate is denoted in *"Rubel to Euro"* or in *"Rubel in Euro"*. Moreover, discuss the implications of the increase in the shown exchange rate for Russian firms that like to export their products as well as for Russian consumers of products from the rest of the world.

   (b) (4 points) Suppose you have one thousand US dollars this year that you want to invest for one year and then buy something with the dollars. Calculate the return on an investment in the U.S. or the European Union, given the following conditions:

   - The annual interest rate in Europe is 0%.
   - The annual interest rate in the U.S.A. is 1%.
   - \$1.10 can be converted to €1 this year.
   - You expect that €1 can be converted to \$1 next year.
   - Moreover, you expect no inflation in Germany and the U.S.

2. (5 points) **[Ricardian Trade Theory]** Suppose that there are only two countries, A and B. Both countries are equally endowed with the single factor of production, labor, which can be used to produce either good y or good x. The following table shows the input coefficients a for both countries, i.e., the units of labor needed to produce one unit of good y or good x.

Good:	y	x
Country A	1	2
Country B	2	4

   (a) Which country has an absolute advantage in producing good y and x, respectively?

   (b) With reference to comparative advantage, explain the trade structure of these two countries.

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3. (4 points) **[Heckscher Ohlin Model]**

   Given are the assumptions of the Heckscher-Ohlin Model. In particular, assume that only two countries, A and B, and two goods, y and x, exist. Consider the following factor endowments:

	Countries	
Factor Endowments	A	B
Labor Force	40	30
Capital Stock	30	10

   Referring to the Heckscher-Ohlin theorem, state which country will export or import the capital-intensive good y and the labor-intensive good x.

4. **[Trade Policy]**

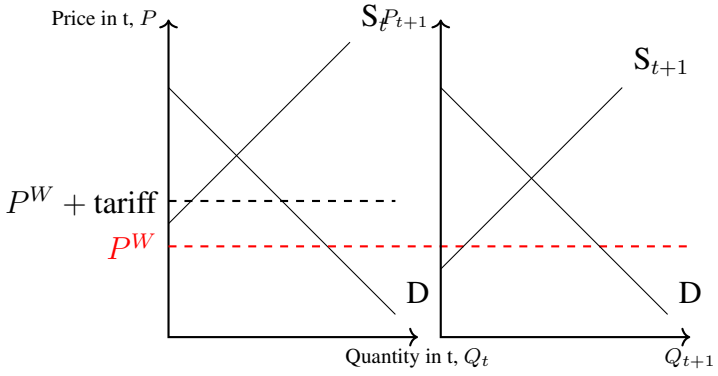
   (a) (6 points) Trade (exports plus imports) and GDP have increased significantly over the last 100 years. However, trade grew much faster than GDP. Discuss the reasons for this.

   (b) (10 points) A tariff protects domestic producers and increases their surplus, it reduces the surplus of consumers and leads to a deadweight loss of revenue. Overall, a tariff must lead to a reduction in a country's welfare if the country is considered to be a so-called *small open economy*.

   - Explain what is meant with a *small open economy*.
   - Explain in detail why tariffs can theoretically yield an increase for a *large open economy*.

   (c) (5 points) Discuss what Boris Johnson means when he claims that *free trade is god's diplomacy*.

   (d) (3 points) The following figure was used in the lecture to explain the infant industry argument. Mark the producer surplus in the left panel (assuming that there is a tariff imposed) and in the right panel. Compare the total welfare of the left panel (in t) without a tariff with the total welfare of the right panel (in t+1).



End of exam

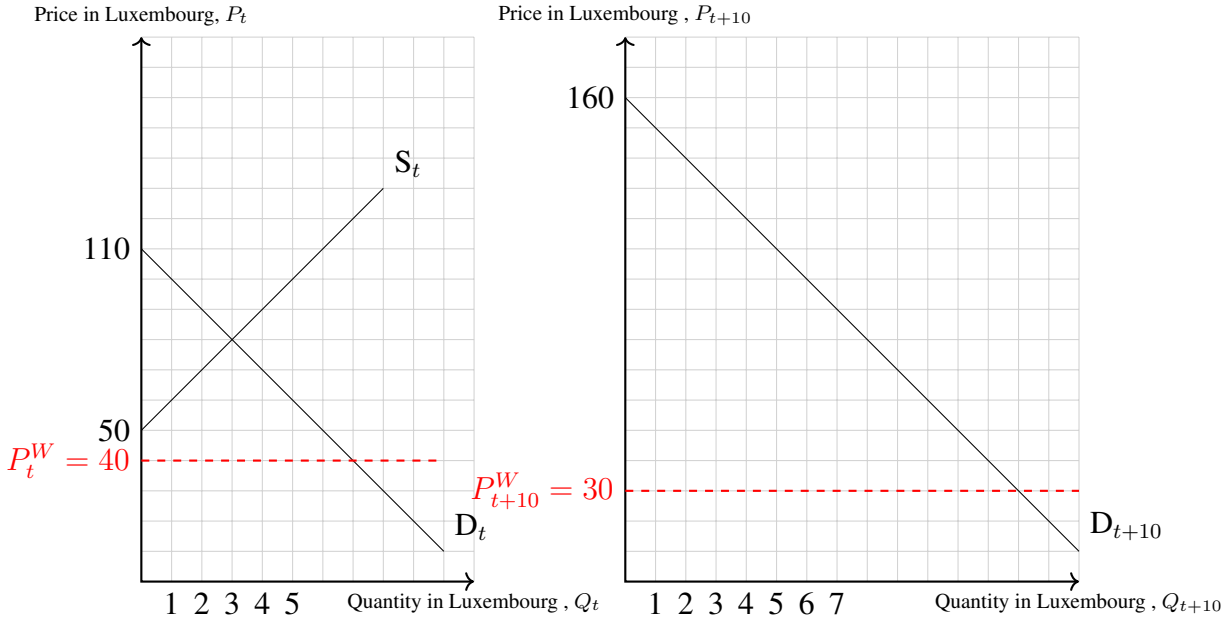
This box is for the examiner only.

Question:	1	2	3	4	5	6	Total
Points:	9	11	5	6	17	12	60
Score:							

Mock Exam

This is a mock exam with 60 points. The real exam has 45 points and you have 45 minutes to work on your exam (plus some time to download and upload the exam for home).

1. **[Trade Policy and the Infant Industry Argument]** The following two price-quantity diagrams show the stylized domestic market for solar panels in Luxembourg in the year t=2022 (left panel) and in ten years, i.e., the year 2032 (right panel). The upward-sloping linear function S_t^G describes domestic supply and the downward-sloping functions describe domestic consumer demand in t and $t+10$, respectively. The dashed red lines describe the world market price over time, P_t^W and P_{t+10}^W. The price is measured in € per solar panel. The x-axis shows the quantity of solar panels, measured in thousands. Luxembourg can be considered as a small open economy.



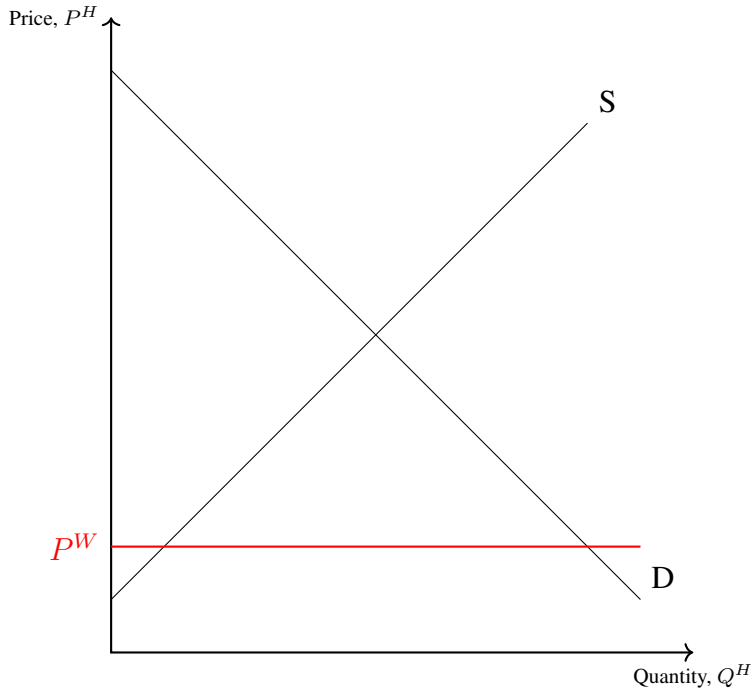
   (a) (2 points) Describe what is meant with a *small open economy*.

   (b) (7 points) Use the two diagrams to explain the *infant industry argument* of international economics. How does the supply function in 2032 have to be so that domestic producers are competitive on world markets.

2. (11 points) **[Tariffs in a Small Open Economy]** The following figure contains—for a small open economy—the domestic supply and demand curves for a single good, x, and the world market price, p^W.

   Use the figure to discuss the economic implications of a tariff, t, for a small open economy. Assume thereby that the tariff is not prohibitively high so that the country remains an importer of good x after the introduction of the tariff. In particular, discuss the producer

and consumer surplus, as well as the overall welfare before and after the introduction of the tariff. Additionally, mark in the figure the quantity of good x that is traded by the small economy with and without a tariff.



3. (5 points) **[Balance of Payments: A Formal Representation]**

   Using the basic equation of economics below, which is also familiar from the lecture, explain why net exports, NEX, must equal net capital outflows, NCO.

   $$Y = C + I + G + EX - IM$$

4. **[Ricardian Trade Theory]**

   Suppose that there are only two countries, A and B. Both countries are equally endowed with the single factor of production, labor, which can be used to produce either good y or good x. The following table shows the labor input coefficients a for both countries, i.e., the units of labor needed to produce one unit of good y or good x. One labor input coefficient is missing.

	Countries	
	A	B
Good y	72	1
Good x	?	4

   (a) (1 point) Which country has an absolute advantage in producing good y.

   (b) (3 points) Suppose no country has a comparative advantage. What is the missing input coefficient a_x of country A then?

   (c) (2 points) What values of country A's missing input coefficient a_x would result in country A having a comparative advantage in good x?

5. **[Monetary International Economics]**

(a) (6 points) Explain what the following *simple rule for* r can teach us:

$$r = w + i.$$

In particular, explain what r, w, and i stand for. When is w a positive number?

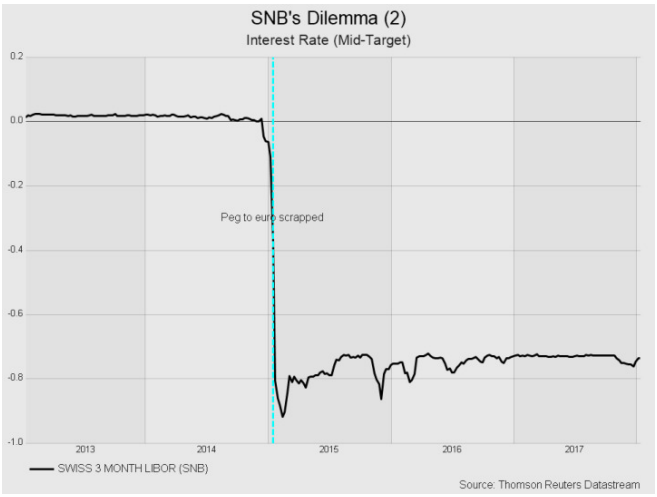
(b) (2 points) The *Purchasing Power Parity Assumption*, a.k.a. the *law of one price* predicts that identical goods should have the same price across countries when expressed in terms of the same currency. However, we often do not observe price differences. Why? Discuss.

(c) (3 points) Price differences across countries can be illustrated with the *Big Mac Index*. It measures the price of a Big Mac in different countries expressed in terms of the US-Dollar. Here is an excerpt of the index:

Country	Price of 1 Big Mac	Price of 1 Big Mac
Germany	$ 4.70	EUR 3.88
Swizerland	$ 6.90	CHF 6.16
United States of America	$ 5.70	

With the information given in the table, calculate the exchange rate of Euros (EUR) to Swiz Franc (CHF).

(d) (2 points) The ***interest rate parity condition*** is an equation that describes the relationship between interest rates and currency exchange rates. The time series below shows that the interest rate for holding assets in Switzerland dropped in January 2015. Referring to the *interest parity condition* what happened to the Swiss Franc. Did the Swiss Franc appreciate or depreciate against the Euro in January 2015?



(e) (2 points) Suppose you have €100 and you want to exchange it into Swiss Franc (CHF). Calculate how much CHF you receive for your €100 when the exchange rate is 0.92 denoted in Swiss Franc to Euro.

(f) (2 points) Explain the trend of the British Pound against the Euro since June 2016 when the Brexit was announced.

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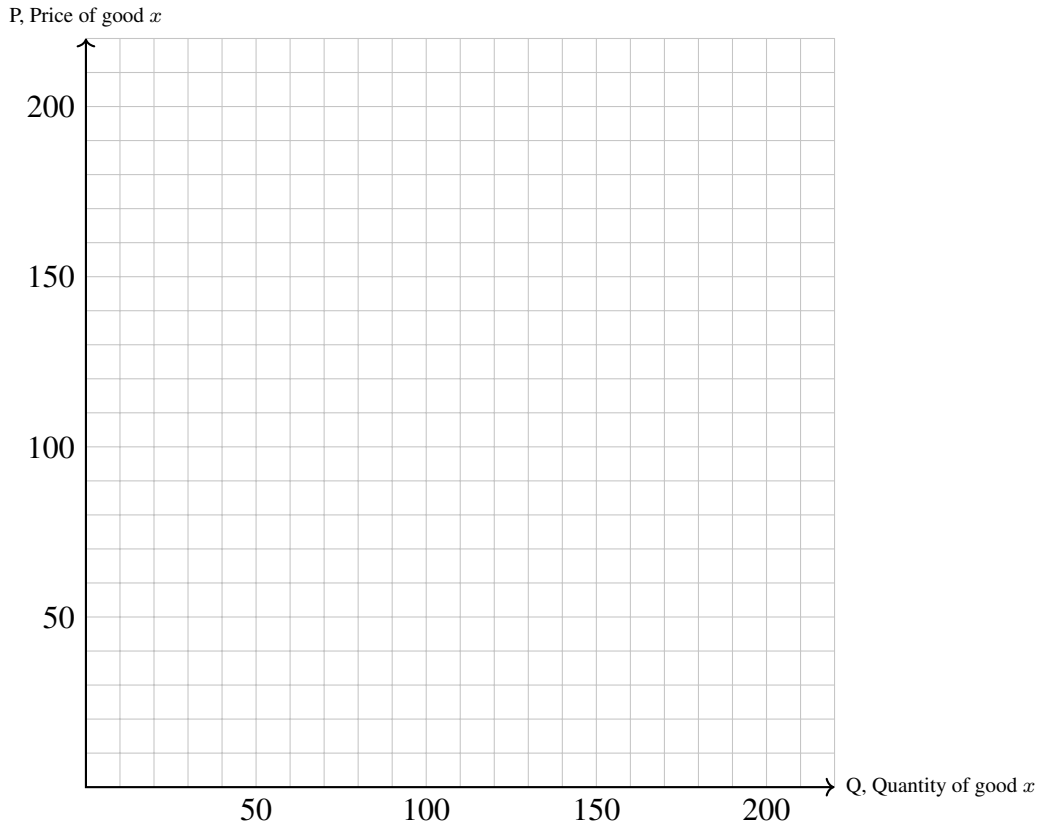
6. **[Small Open Economy and Tariffs]** The government of a *small open economy*, A, needs your help to decide whether the introduction of a tariff of $\$20$ per unit of good x is a welfare improving market intervention, or not. Country A's demand and supply curves for good x are given as follows:

$$Demand: Q^d = 200 - P$$
$$Supply: Q^s = P - 20.$$

Moreover, you know that the world market price of good x is $p^W = \$50$.

(a) (3 points) Draw below the world market price, as well the supply, and the demand curve of country A.



(b) (1 point) What would be the price of good x in the absence of trade, i.e., in autarky?

(c) (2 points) Calculate the quantity of the country's imports under free trade.

(d) (2 points) Calculate the government revenue of the country when it introduces a tariff of $20.

(e) (2 points) Calculate the value of the welfare loss and the welfare gain, respectively, that comes with the introduction of the tariff.

(f) (1 point) With the introduction of the tariff, do the country's consumer surplus increase, decrease, or remain equal with the introduction of the tariff?

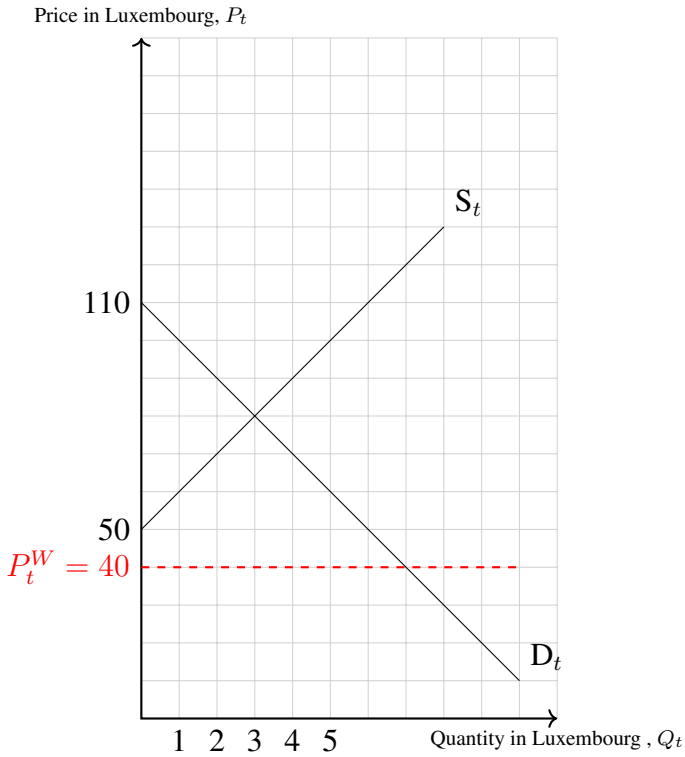
(g) (1 point) With the introduction of the tariff, do the country's producer surplus increase, decrease, or remain equal ?

End of exam

This box is for the examiner only.

Question:	1	2	3	4	5	Total
Points:	19	3	9	9	5	45
Score:						

1. **[Trade Policy]** The following price-quantity diagram shows the stylized domestic market for solar panels in Luxembourg in the year t=2022 (left panel). The upward-sloping linear function S_t^G describes domestic supply and the downward-sloping functions describe domestic consumer demand in t and $t+10$, respectively. The dashed red lines describe the world market price over time, P_t^W and P_{t+10}^W. The price is measured in € per solar panel. The x-axis shows the quantity of solar panels, measured in thousands. Luxembourg can be considered as a small open economy.



(a) (2 points) Describe what is meant with a *small open economy*.

(b) (1 point) How many solar panels are consumed in Luxembourg under free trade in 2022?

(c) (1 point) How many solar panels are consumed in Luxembourg under free trade in 2031?

(d) (2 points) How many solar panels are produced in Luxembourg in 2022.

(e) (6 points) The president of Luxembourg wants to establish an industry for solar panels by imposing a tariff on foreign solar panels. Discuss how high a trade tariff on foreign panels should be to become effective. Also discuss alternative policy instruments to protect domestic manufacturers from foreign competition.

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(f) (7 points) Let us assume that Luxembourg introduces a tariff of 30 euros per solar module in 2022.

- How many solar panels will be consumed in Luxembourg?
- How many solar panels will be produced in Luxembourg?
- How many solar panels will be imported and exported, respectively?
- Sketch the consumer surplus after the introduction of the tariff.
- Sketch the producer surplus after the introduction of the tariff.
- Sketch the governemet surplus after the introduction of the tariff.
- Sketch the deadweight loss that comes with the tariff.

2. (3 points) **[Foreign Exchange Market]** Assume you have to give €1.4 to receive \$2 at the foreign exchange market (FOREX) in period one. Further assume that the € is the home currency and the \$ the foreign currency.

- Write down the exchange rate in direct quotation.
- If the exchange rate in direct quotation increases, does it imply that the € appreciates or depreciate with respect to the \$?

3. **[Ricardian Trade Theory]**

(a) (4 points) Briefly explain the main differences between the Ricardian model and the Heckscher-Ohlin model.

(b) (5 points) Suppose that there are only two countries, A and B. Both countries are equally endowed with the single factor of production, labor, which can be used to produce either good y or good x. The following table shows the input coefficients a for both countries, i.e., the units of labor needed to produce one unit of good y or good x.

	Countries	
	A	B
Good y	71	1
Good x	72	4

i) Which country has an absolute advantage in producing good y and x, respectively.

ii) Name the country with a comparative advantage in good x.

4. **[Monetary International Economics]**

(a) (6 points) Explain what the following *simple rule for* r can teach us:

$$r = w + i.$$

In particular, explain why it is a "simple" rule, what r, w, and i stand for, and when w is a positive and negative number, respectively?

(b) (3 points) Price differences across countries can be illustrated with the *Big Mac Index*. It measures the price of a Big Mac in different countries expressed in terms of the US-Dollar. Here is an excerpt of the index:

Country	Price of 1 Big Mac	Price of 1 Big Mac
Germany	$ 4.70	EUR 3.88
Swizerland	$ 6.90	CHF 6.16
United States of America	$ 5.70	

With the information given in the table, calculate the exchange rate of Euros (EUR) to Swiz Franc (CHF).

5. (5 points) **[Trade Policy]**

Trade (exports plus imports) as a share of GDP has increased significantly over the last 100 years. Discuss the reasons for this process.

End of exam

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	14	4	2	10	30
Score:					

1. **[Infant Industry Argument]** The two diagrams of Figure 1 show the stylized domestic markets for lemons for Germany (left panel) and Italy (right panel). The upward sloping line describes domestic lemon producer supply in each country and the downward sloping line describes domestic consumer demand. The dashed red line describes the fixed world market price, $p^W = 4€$. The price is measured in € per kg of lemons. The x-axis shows the quantity of lemons, measured in tons. Assume that both countries are small open economies in terms of the lemon market.

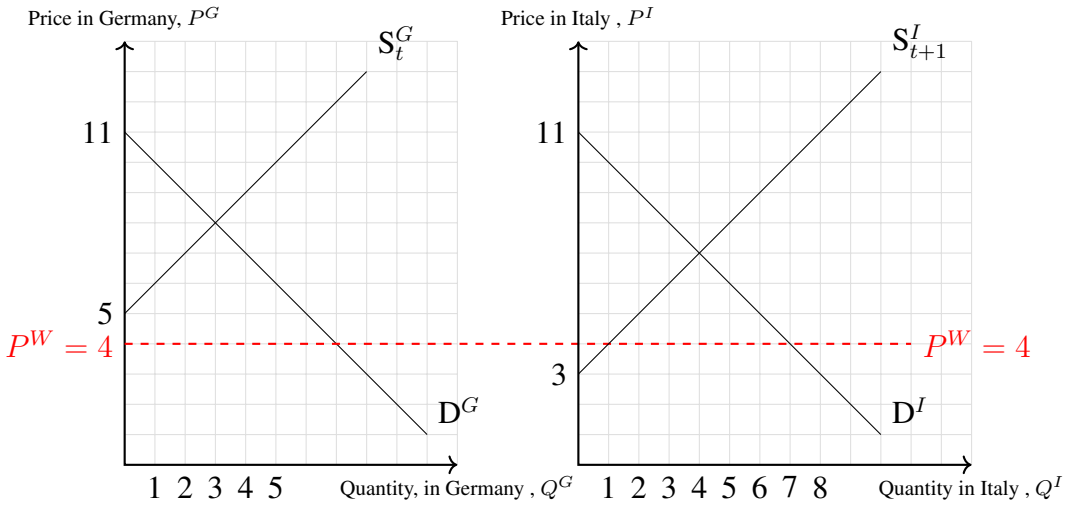


Figure 1: Stylized Lemon Market

(a) (2 points) Describe what is meant in international economic theory when it assumed that a country is a "small open economy".

(b) (1 point) How many tons of lemons are consumed in Germany and in Italy under free trade?

(c) (2 points) How many tons of lemons do producers in Germany and in Italy sell domestically under free trade?

(d) (2 points) How many tons of lemons do producers in Germany and in Italy export under free trade?

(e) (4 points) Suppose a pandemic forces borders to close completely, i.e., no international trade is allowed.

- How many tons of lemons are consumed in Germany and in Italy?
- How many tons of lemons do producers sell in Germany and in Italy?

(f) (3 points) Use Figure 1 to explain the infant industry argument as a justification to regulate international trade briefly.

2. (4 points) **[Balance of Payments: A Formal Representation]**

   Given the fundamental equation of economics below that is also known from the lecture, explain why net exports, NEX, must be equal to net capital outflow, NCO.

   $$Y = C + I + G + EX - IM$$

3. (2 points) **[Foreign Exchange Market]** Assume you have to give €1.4 to receive \$2 at the foreign exchange market (FOREX) in period one. Further assume that the € is the home currency and the \$ the foreign currency.

   - Write down the exchange rate in direct quotation.
   - If the exchange rate in direct quotation increases, does it imply that the € appreciates or depreciate with respect to the \$?

4. **[Ricardo]**

   (a) (4 points) Discuss the main differences of the Ricardian Model and the Heckscher-Ohlin Model briefly.

   (b) (6 points) Assume that only two countries, A and B, exist. Both countries are equally endowed with the only production factor labor which can be used to produce either good y or good x. The table below gives input coefficients, a, for both countries, i.e., the units of labor needed to produce one unit of good y and good x, respectively. The input coefficients a_y^B is missing.

	Countries	
	A	B
Good y	20	21
Good x	1	4

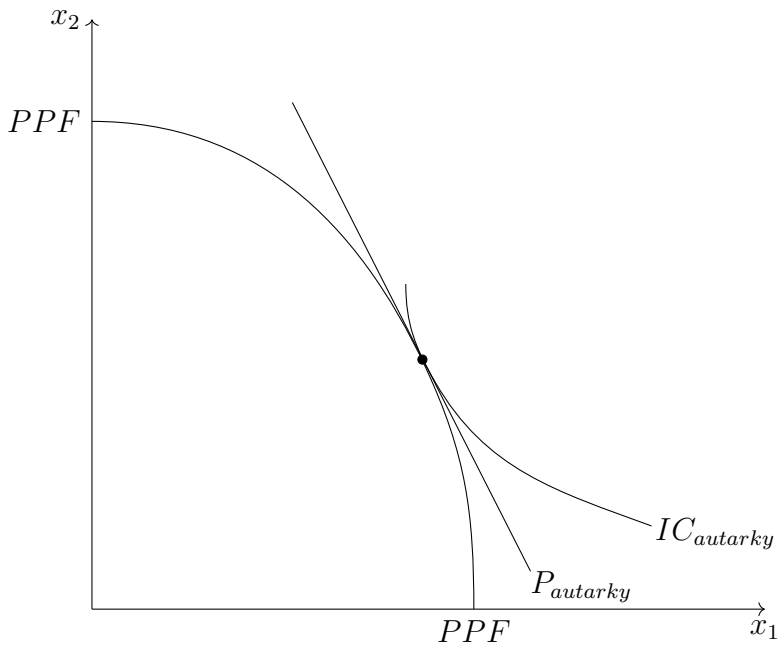
   i) Name the country with an absolute advantage.

   ii) Name the country with a comparative advantage in good y.

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	8	10	8	4	30
Score:					

1. **[Production, Consumption, and Trade]** The figure below shows the production possibility frontier curve, PPF, of a country, H, in autarky in which only two products, x_1 and x_2, can be produced and consumed, respectively.



(a) (2 points) Given the country is in autarky (i.e., no trade), the price relation of both good within the country is represented by the line denoted with $P_{autarky}$. The indifference curve that represents the utility maximizing level of utility is denoted with $IC_{autarky}$. Mark in the figure how much of both goods are produced and consumed, respectively.

(b) (6 points) Suppose country H opens up to trade with foreign countries. Further assume that the country can trade with other countries at fixed world market prices

$$\left(\frac{p_1}{p_2}\right)_W > \left(\frac{p_1}{p_2}\right)_H .$$

Sketch the world market price relation in the figure and mark the new production point on the production possibility frontier curve. Moreover, mark below those statements that are **true**:

i) Country H will produce more of good x_1 than in autarky

ii) Country H will produce more of good x_2 than in autarky

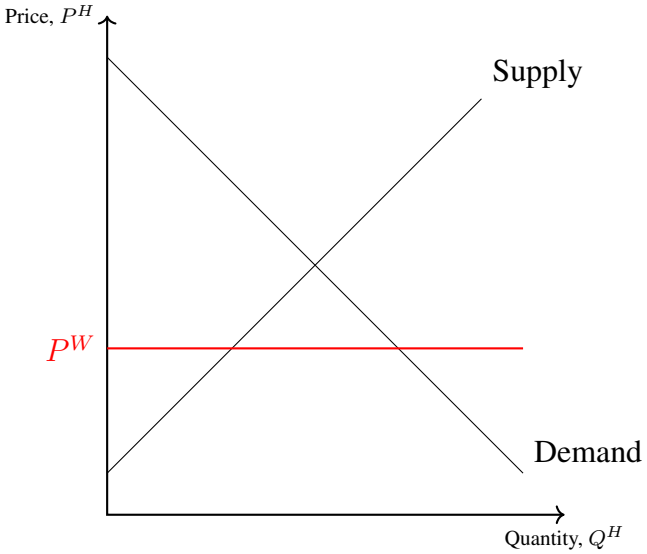
iii) Country H will consume more of good x_1 than in autarky

iv) Country H will export good x_1 and import good x_2.

v) Country H will export good x_2 and import good x_1.

vi) Country H will suffer a loss of welfare due to opening up to trade.

2. (10 points) **[Export/Import]** Suppose there is a small open economy that can buy and sell goods at the world market price, P^W, as is shown in the diagram below. Now, assume the rest of the world wants to close all borders to the small open economy such that international trade is not possible anymore for the small economy. Discuss implications concerning consumer surplus, producer surplus, overall welfare, and market price when the rest of the world would close borders, i.e., the small country would be in autarky.



3. **[Ricardo]**

   (a) (4 points) Discuss the main differences of the Ricardian Model and the Heckscher-Ohlin Model.

   (b) (4 points) Assume that only two countries, A and B, exist. Both countries are equally endowed with the only production factor labor which can be used to produce either good y or good x. The table below gives input coefficients, a, for both countries, i.e., the units of labor needed to produce one unit of good y and good x, respectively. The input coefficients a_y^B is missing.

	Countries	
	A	B
Good y	10	11
Good x	1	2

   i) Name the country with an absolute advantage.

   ii) Name the country with a comparative advantage in good y.

4. (4 points) **[Balance of Payments: A Formal Representation]**

   Explain, given the following fundamental equation to explain an open economy, why net exports, NEX, must be equal to net capital outflow, NCO.

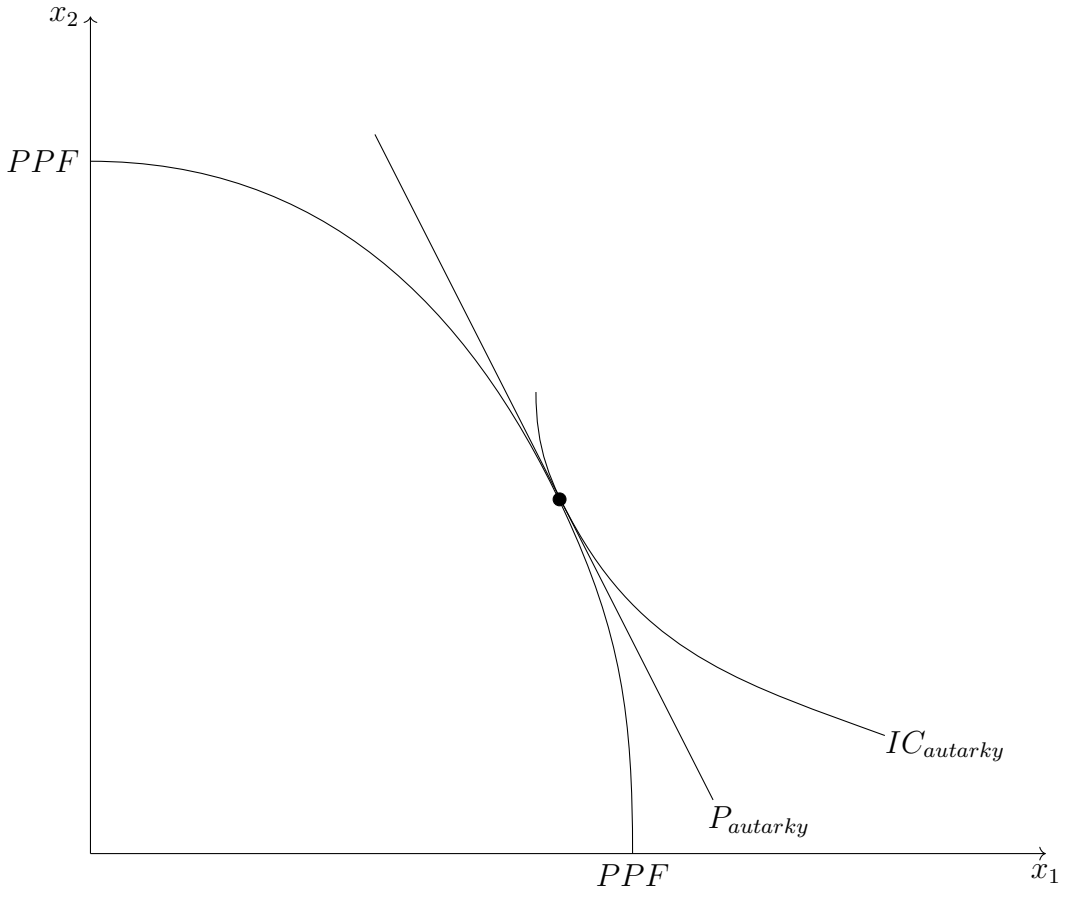
   $$Y = C + I + G + EX - IM$$

This box is for the examiner only.

Question:	1	2	3	4	Total
Points:	8	6	11	5	30
Score:					

Questions

1. [**Production, Consumption, and Trade**] The figure below shows the production possibility frontier curve, PPF, of a country, H, in autarky in which only two products, x_1 and x_2, can be produced and consumed, respectively.



(a) (2 points) Given the country is in autarky (i.e., no trade), the price relation of both good within the country is represented by the line denoted with $P_{autarky}$. The indifference curve that represents the utility maximizing level of utility is denoted with $IC_{autarky}$. Mark in the figure how much of both goods are produced and consumed, respectively.

(b) (6 points) Suppose country H opens up to trade with foreign countries. Further assume that the country can trade with other countries at fixed world market prices

$$\left(\frac{p_1}{p_2}\right)_W < \left(\frac{p_1}{p_2}\right)_H .$$

Sketch the world market price relation in the figure and mark the new production point on the production possibility frontier curve. Moreover, mark below those statements that are **true**:

- ◯ Country H will produce more of good x_1 than in autarky
- ◯ Country H will produce more of good x_2 than in autarky
- ◯ Country H will consume more of good x_1 than in autarky
- ◯ Country H will export good x_1 and import good x_2.
- ◯ Country H will export good x_2 and import good x_1.
- ◯ Country H will suffer a loss of welfare due to opening up to trade.

2. (6 points) [**Heckscher-Ohlin**] The following statments refer to the Heckscher-Ohlin model as introduced in the lecture. Two of the following statments are incorrect. State which statments are **incorrect** and explain in detail why they are incorrect.

   a) The assumptions of the HO-Model are: Two countries, two goods, two factors of production, goods differ with respect to their needs of factors in production, countries differ with respect to their production technology, different relative factor endowments, free factor movement across sectors, no trade costs, same tastes across countries and homothetic preferences.

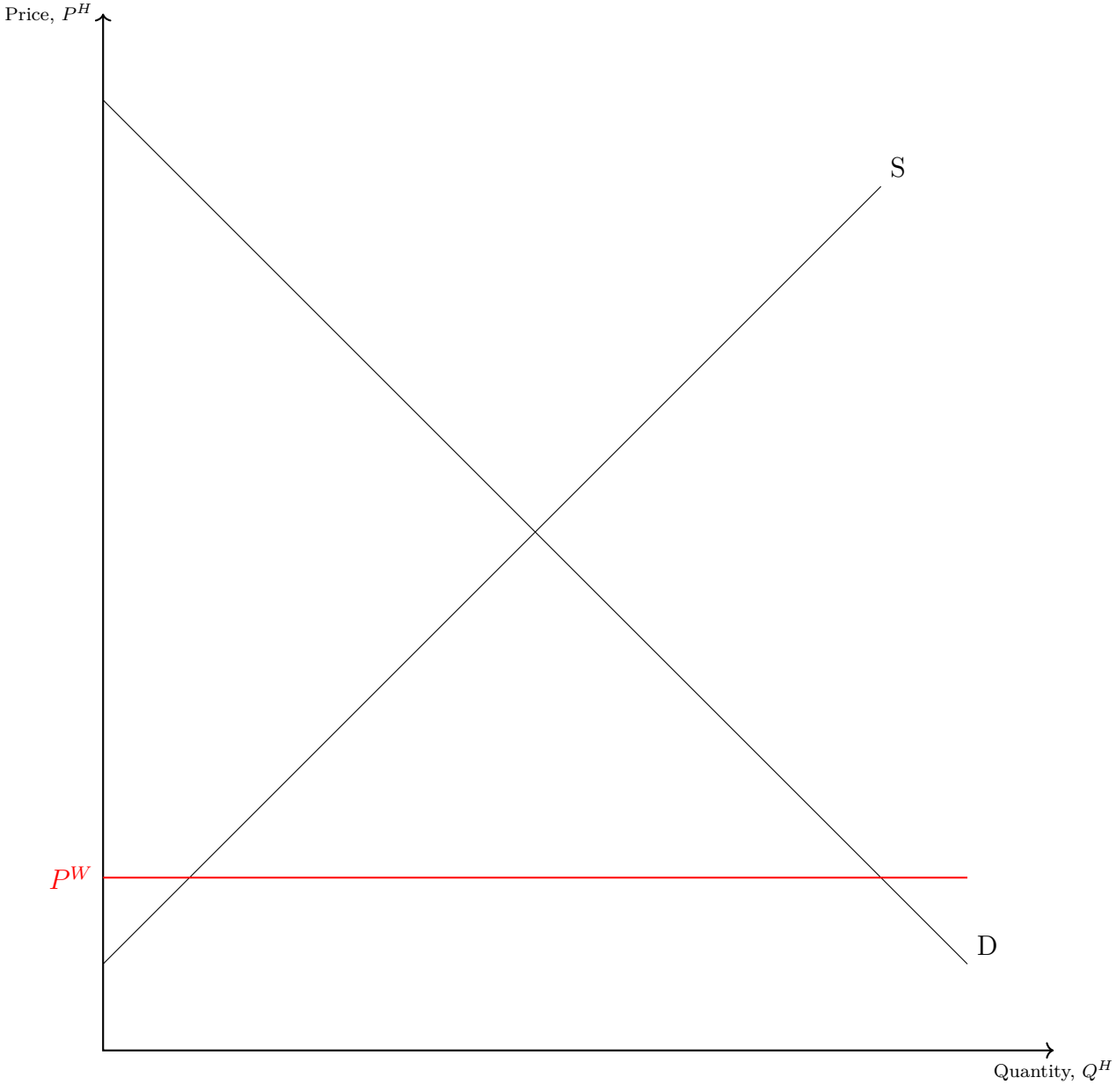
   b) The labor abundant country exports the capital-intensive good. The capital abundant country exports the labor-intensive good.

   c) The prices of the two factors of production (wage and rent) will be equalized across countries as a result of international trade in goods.

   d) The factor price equalization theorem includes an interesting insight: If a country allows free trade in its outputs, it will automatically export the abundant factor indirectly in the form of those goods that are intensive in the abundant factor.

3. (11 points) [**Tariffs in a Small Open Economy**] The following figure contains—for a small open economy—the domestic supply and demand curves for a single good, x, and the world market price, p^W.

   Use the figure to discuss the economic implications of a tariff, t, for a small open economy. Assume thereby that the tariff is not prohibitively high so that the country remains an importer of good x after the introduction of the tariff. In particular, discuss the producer and consumer surplus, as well as the overall welfare before and after the introduction of the tariff. Additionally, mark in the figure the quantity of good x that is traded by the small economy with and without a tariff.



4. (5 points) [**Monetary International Economics**]

Price differences across countries can be illustrated with the *Big Mac Index*. It measures the price of a Big Mac in different countries expressed in terms of the US-Dollar. Here is an excerpt of the index:

Country	Price of 1 Big Mac	Price of 1 Big Mac
Germany	\$ 4.70	EUR 3.88
Swizerland	\$ 6.90	CHF 6.16
United States of America	\$ 5.70	

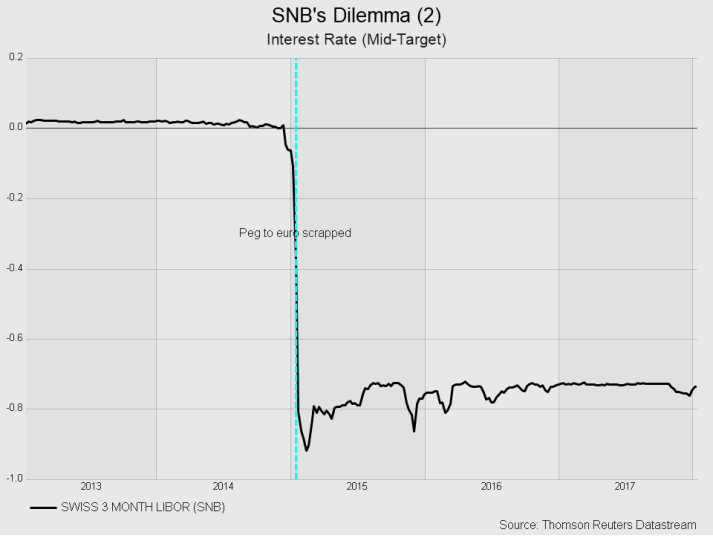
With the information given in the table, calculate the exchange rate of Euros (EUR) to Swiz Franc (CHF).

This box is for the examiner only.

Question:	1	2	3	4	5	Total
Points:	6	5	5	4	10	30
Score:						

Questions

1. [**Foreign Exchange Market**]



(a) (2 points) The ***interest rate parity condition*** is an equation that describes the relationship between interest rates and currency exchange rates. The time series above shows that the interest rate for holding assets in Switzerland dropped in January 2015. Referring to the *interest parity condition* what happened to the Swiss Franc. Did the Swiss Franc appreciate or depreciate against the Euro in January 2015?

(b) (2 points) Suppose you have €100 and you want to exchange it into Swiss Franc (CHF). Calculate how much CHF you receive for your €100 when the exchange rate is 0.92 denoted in Swiss Franc to Euro.

(c) (2 points) Explain the trend of the British Pound against the Euro since June 2016 when the Brexit was announced.

2. (5 points) [**Infant Industry Argument**] Explain briefly the ***infant industry argument***.

3. (5 points) [**Balance of Payments: A Formal Representation**]

Explain, given the following fundamental equation to explain an open economy, why ***net exports,*** NEX***, must be equal to net capital outflow,*** NCO.

$$Y = C + I + G + EX - IM \tag{1}$$

4. [**Comparative Advantage**] Assume that only two countries, A and B, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The table below gives the input coefficients, a, for both countries, i.e., the units of labor needed to produce one unit of good y and good x, respectively.

	Countries	
	A	B
Good y	400	2
Good x	300	1

(a) (1 point) Name the country with an absolute advantage.

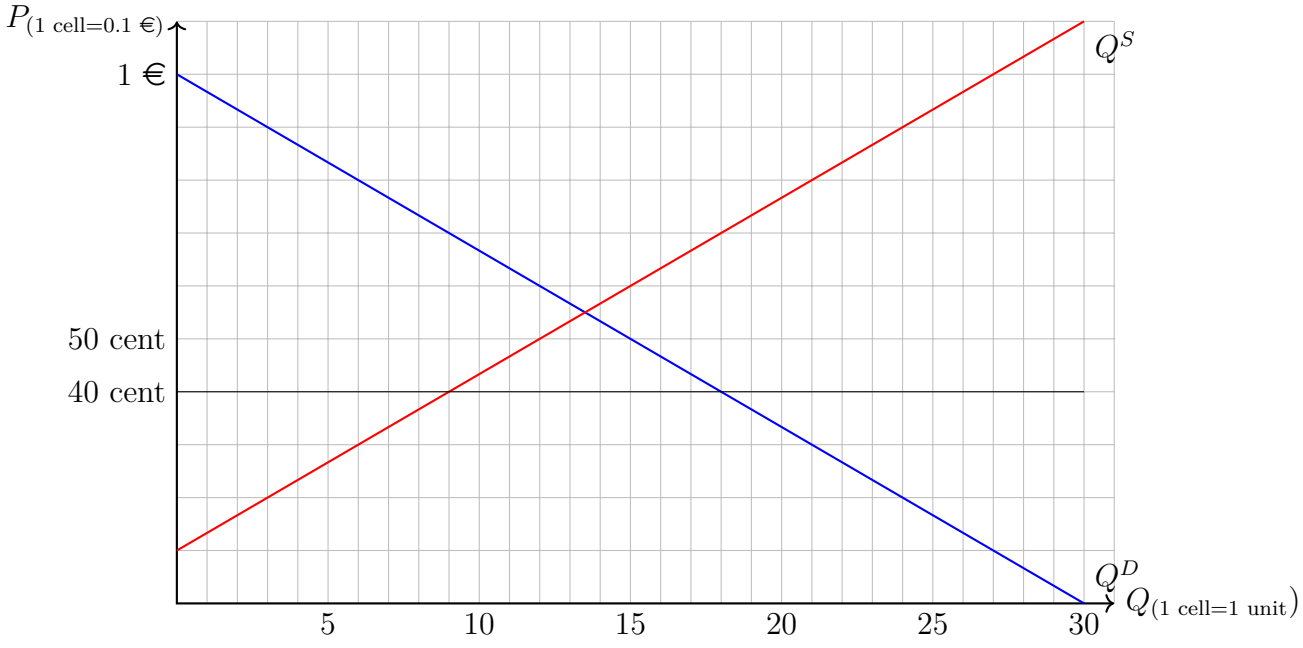
(b) (2 points) Name the country with a comparative advantage in good y.

(c) (1 point) Name the country with a comparative advantage in good x.

5. **[Trade Policy]** The government of a *small open economy*, A, needs your help to decide whether the introduction of a tariff of €0.10 per unit of good x is a welfare improving market intervention, or not. Country A's market demand and supply for a good x is given as follows:

$$Demand: Q^D = 30 - 30P$$
$$Supply: Q^S = 30P - 3.$$

Moreover, you know that the world market price of good x is $p^W =$ €0.40. Below you find a plot with the given world market price, as well as the supply, and the demand curve of country A.



(a) (2 points) What would be the price of good x in the absence of trade, i.e., in autarky?

(b) (2 points) Calculate the quantity of the country's imports under free trade.

(c) (2 points) Calculate the government revenue of the country when it introduces a tariff of €0.10.

(d) (2 points) Calculate the value of the welfare loss and the welfare gain, respectively, that comes with the introduction of the tariff.

(e) (1 point) With the introduction of the tariff, do the country's consumer surplus increase, decrease, or remain equal with the introduction of the tariff?

(f) (1 point) With the introduction of the tariff, do the country's producer surplus increase, decrease, or remain equal?

This box is for the examiner only.

Question:	1	2	3	4	5	6	Total
Points:	4	2	6	7	8	3	30
Score:							

Questions

1. [**Foreign Exchange Market**]

(a) (2 points) The timeline above shows the exchange rate of the British Pound Sterling (£) and the Euro (€). The y-axis is not labeled. State how the exchange rate is denoted here.

(b) (2 points) Suppose you have €100 and you want to exchange it into British Pound Sterling (£). Calculate how much £ you receive for your €100.

2. (2 points) [**Interest Parity Condition**] The Swiss central bank unpegged the Franc from the Euro in 2015. Referring to the interest parity condition, name the two major economic consequences without going into details.

3. (6 points) [**International Investments**] In the lecture, we discussed three components to see how the value of an investment changes over time, when it was invested in an asset abroad. Describe the three components briefly and write down the formula that allows to calculate the rate of return of an international investment.

4. **[Comparative Advantage]** Assume that only two countries, A and B, exist. Both countries are equally endowed with labor which is the only production factor. Both countries can produce either good y or good x. The table below gives the input coefficients, a, for both countries, i.e., the units of labor needed to produce one unit of good y and good x, respectively.

	Countries	
	A	B
Good y	200	2
Good x	300	1

(a) (1 point) Name the country with an absolute advantage.

(b) (2 points) Name the country with a comparative advantage in good y.

(c) (1 point) Name the country with a comparative advantage in good x.

(d) (3 points) Suppose you are the economic advisor of the President of country A. He asks you to read a first draft of his upcoming speech. Here is an excerpt of the speech:

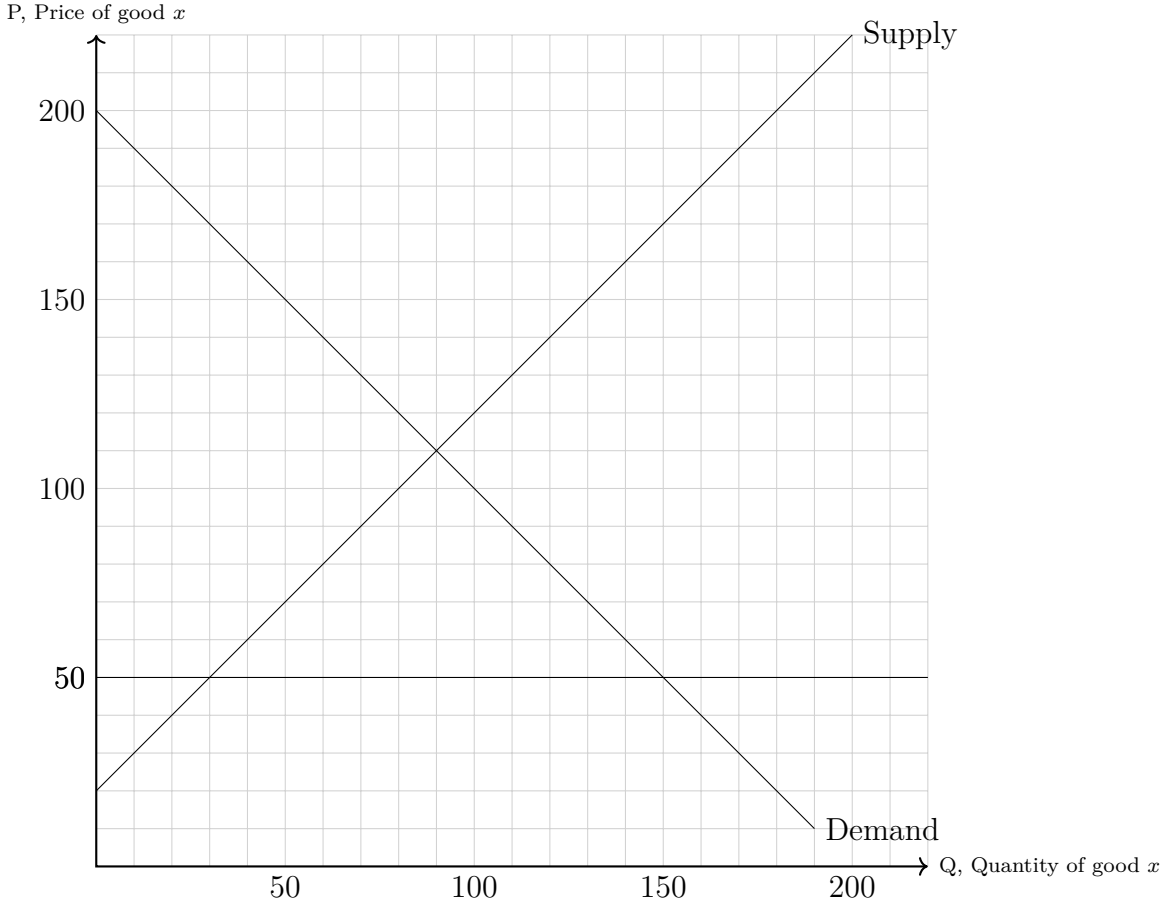
> *"We need to train our workers to increase our productivity. Otherwise we are not competitive on global markets and cannot exports anything."*

Explain to the President what he may have misunderstood.

5. [**Trade Policy**] The government of a *small open economy*, A, needs your help to decide whether the introduction of a tariff of \$20 per unit of good x is a welfare improving market intervention, or not. Country A's demand and supply curves for good x are given as follows:

$$Demand: Q^d = 200 - P$$
$$Supply: Q^s = P - 20.$$

Moreover, you know that the world market price of good x is $p^W = \$50$. Below you find a plot with the given world market price, as well as the supply, and the demand curve of country A.



(a) (1 point) What would be the price of good x in the absence of trade, i.e., in autarky?

Solution: The autarky price would be \$110.

(b) (1 point) Calculate the quantity of the country's imports under free trade.

Solution: The quantity of the country's imports under free trade would be 80 units of good x.

(c) (2 points) Calculate the government revenue of the country when it introduces a tariff of \$20.

Solution: The government revenue of the country when it introduces a tariff of \$20 would be $\$20 \cdot 80 = \$1600$.

(d) (2 points) Calculate the value of the welfare loss and the welfare gain, respectively, that comes with the introduction of the tariff.

Solution: The welfare loss would be $20 \cdot \$20 = \$400$.

(e) (1 point) With the introduction of the tariff, do the country's consumer surplus increase, decrease, or remain equal with the introduction of the tariff?

Solution: The consumer surplus would decrease.

(f) (1 point) With the introduction of the tariff, do the country's producer surplus increase, decrease, or remain equal?

Solution: The producer surplus would increase.

6. (3 points) **[Heckscher-Ohlin]** Explain the content of the Heckscher-Ohlin Theorem (1-3 sentences).