EXAMINATION

Course code:	Course:
SFB 12614	**International Finance (10 ECTS)**

Date:	Duration:
May 5, 2020	09:00 – 13:00 (4 hours) Central European Summer Time (Norway Time)

	Lecturer:
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The examination:

The examination document consist of 5 pages inclusive this page. Please check that the examination document is complete before you start answering the questions.

The exam consists of 4 (four) exercises. You must solve all four exercises. The exercises have equal weight.

Show all your calculations. Interpret the meaning of your results. Explain all symbols that are not already explained in the given text. If formulas are involved, first work with the general formula, then later fill in numbers. Clearly indicate what your final answer is. Good luck!

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1. Forward Exchange Rate and Forward Premium or Discount

Instruction: Structure your answers to precisely fit each of the sub-questions.

a)
Let UK£ denote UK Pound Sterling. Let CA$ denote Canadian Dollar.
Let Canada be the Home Country.
With the instruction that Indirect Quotation must be used, write down the general formula for a Forward Exchange Rate between UK£ and CA$.

b)
Now consider the following numerical values:
        Spot Exchange Rate: UK£ 0.600 per one CA$.
        Interest rate on UK£: 10% per year (360 days)
        Interest rate on CA$: 2% per year (360 days)
        Number of days forward: 180.
Your task: Compute the 180-day Forward Exchange Rate given the above numerical values. (The assumption that Canada is the Home Country and the instruction that Indirect Quotation be used continue to be valid.)

c)
A concept that is related to the Forward Exchange Rate is the *Forward Premium or Discount.*
Using the information and assumptions given in (a) and (b), and using the result that you computed in (b), your task is as follows: Write down the appropriate version of the formula for the forward premium or discount in terms of the percent-per-annum premium or discount.

d)
Substituting numerical values and result of (b), calculate the percent-per-annum premium or discount. Interpret your result.

2. Purchasing Power Parity and Exchange Rate Pass-Through

Instruction: Structure your answers to precisely fit each of the sub-questions.

Companies that are internationally active are aware of the linkage between prices of goods and exchange rates between currencies. Companies are often less aware than they should about consumer attachment to certain products. Take for example the story of the Toyota Tercel. It is a subcompact car that was manufactured in Japan from 1978 to 2000 across five model generations. The Tercel was the first front-wheel-drive vehicle ever produced by Toyota. One of the models, a hatchback, enjoyed particular popularity worldwide. It was known to have a motor that would keep running long after the car's outer hull had fallen apart. When this model was discontinued a great sadness spread among its fans worldwide. Sadness transformed into protest. Finally Toyota understood and began to re-manufacture the Tercel hatchback due to popular demand and figured on a substantially higher price than the earlier discontinued model. It was, in particular, counting on substantial export to the US market. And this is where we turn to prices and exchange rates, beginning with the following information:

Among the Tercel hatchback fans the first day the 'new' Tercel went on the market has become part of mythology. This day is commonly referred to as '*Day 1- after'* or *' Day-1'* for short. We take the perspective of *'Day-1'.*
The export price of the Tercel, on *'Day-1',* expressed in Japanese Yen (¥), is ¥ 4,000,000 (four million). The exchange rate against the US dollar on this memorable day is
¥ 120.00/USD. The forecast rate of inflation in the USA is 4% per year. The forecast rate of inflation in Japan is 0% per year.

   a) Calculate the export price of the Tercel on *'Day-1'* expressed in US dollars?

   b) Under the assumption that purchasing power parity holds, calculate what the exchange rate should be exactly one year after '*Day-1'?*

   c) Calculate what the dollar price of a Tercel should be one year after '*Day-1'* under the assumption of 100% exchange rate pass-though?

   d) Calculate what the dollar price of a Tercel should be one year after '*Day-1'* under the assumption of 60% exchange rate pass-through?

   e) Does 60% exchange rate pass-through imply a reduction in revenue for Toyota in the US market, relative to 100% pass-through? Explain.

3. Investment Alternatives

Instruction: Structure your answers to precisely fit each of the sub-questions.

Consider the following situation:
You have € 10.000.000 (ten million euro) in hand. You plan to use this money later in the year to buy a large villa by the sea in Spain.
In the meantime, you think that it is not a good idea to let the money just sit in your bank account. So you look at a number of short term investment opportunities. After studying many investment alternatives there are two of them that attract your attention. You decide to analyze both of them in detail before committing you € 10.000.000, and you disregard all other possibilities. You want to calculate which of the two investment alternatives gives you higher earnings.
Case 1
You invest the full amount for 90 days in the euro money market. In the euro money market you would earn interest at a rate of $i^€ = 2\%$ per 90 days. This investment opportunity is attractive because of its simplicity. You do not have to convert your euros into another currency. You can calculate your return on investment at the beginning of the investment period.
Case 2
You invest the full amount for 90 days in the UK Pound Sterling (UK£) money market. In the UK£ money market you would earn interest at a rate of $i^£ = 10\%$ per 90 days. This investment opportunity is a bit more complicated because you need to convert your euros into UK£ in order to invest. And at the end of the investment period you need to convert UK£ back into euros so that you can buy your villa in Spain, for which you need euros. While this case 2 investment is a bit more complicated it is not particularly risky. This is because the first currency conversion uses the known spot rate and the second currency conversion uses a forward rate that you lock in at the beginning of the investment period. So at the beginning of the investment period you can already calculate your return on investment.

Suppose that at the beginning of the 90-day investment period the relevant exchange rates are as follows:

Spot exchange rate: 1.50 euros per one UK Pound Sterling.
90-day forward exchange rate: 1.01 euros per one UK Pound Sterling

Your Task:

a) Which of the two investment alternatives gives you higher earnings? Show all your calculations.

b) Does your result imply that Interest Rate Parity holds in this situation? Explain why or why not.

4) Option Profit Diagram

Instruction: Structure your answers to precisely fit each of the sub-questions.

Consider the following Option Profit Diagram:
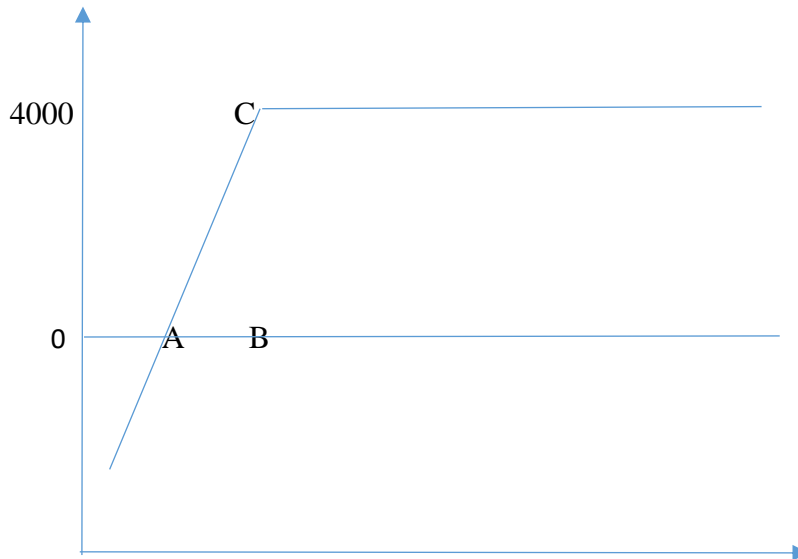
In the above diagram, point A marks the intersection between the rising part of the profit figure and the horizontal line indicating value zero on the vertical axis. C marks the 'kink' point where the profit figure changes from the rising line segment to the horizontal line segment. It measures 4000 on the vertical axis. B is the projection of the 'kink' point C onto the horizontal line, measuring zero on the vertical axis. Points C and B have the same value on the horizontal axis (B lies perpendicularly underneath point C).

a) Whose profit diagram is drawn here? (Buyer, Seller, Put, Call)

b) What is measured on the horizontal axis?

c) What is measured on the vertical axis?

d) Write down the profit function that is associated with the above diagram.

e) Why does the profit diagram have a rising line segment and a horizontal line segment? Explain in detail.

f) For determining whether the option is 'in the money' or 'out of the money': Which of the two points, A or B, is the relevant one? Explain.

g) Using your profit function from (d), substitute well-chosen numbers into the formula, so that the numerical value of the profit function gives you a point on the rising line segment between points A and C, but excluding points A and C themselves. ∎