Assessment guidelines SØK 1151, fall 2023

This document is guidelines for assessment. Thus, it is not a complete suggestion of solution. Some of the presentation here is shorter than expected for a complete solution.

Question 1 (20%)

Explain the following terms briefly:

a) Gross national product
b) The multiplier effect
c) Hyperinflation
d) Trade balance
e) Primary deficit

a) Gross national product (GNP) is the sum of the gross domestic product (GDP) and net income payments from the rest of the world (NI). GDP is a measure of the aggregate production in the economy, while NI is income received from the rest of the world (citizens owing firms in other countries, paid work in other countries, etc.) and income paid to the rest of the world. GNP is thus a measure of the value added by domestic factors of production (mainly labour and capital).

b) In economics, the multiplier effect is about the dynamics of production. When production increases, so do the income in the economy. Some of the higher income is used for consumption, determined by the marginal propensity to consume. The extra consumption must be produced, and it therefore increases production. Which again increases consumption and production. It is a converging process, which gives a higher increase in production than the initial rise. The same effect goes via investment, and it might be relevant to say something on the effect via import.

c) Hyperinflation is a very high inflation. It is not expected that the answer will include a more detailed explanation. It is not asked for reasons for hyperinflation, but it might be relevant to discuss challenges with a high public debt-to-GDP ratio.

d) Trade between countries has two directions. It is products out of the country – export – and products into the country – import. The trade balance is the difference in the value of export and import, measured at a common currency. The trade balance in common currency can be expressed in different ways. The most usual way is to measure import in the value of domestically produced goods. This is a correction based on the exchange rate and the difference in price levels. it might be useful to be specific, writing the trade balance as $NX = X - IM/\varepsilon$. See the textbook or the lecture notes for definition of notation. The definition must be included in the answer.

e) Primary deficit is the deficit for the public sector, excluding interest payments on debt and returns from public funds. It is government spending, excluding interest payments, minus government revenues, often called tax income for short. It might be useful to use the notation G – T, where G and T then need to be specified.

Question 2 (50%)

Over the last couple of years, the Norwegian currency has depreciated. The domestic currency has fallen in value relative to the foreign currency.

a) Use the interest parity condition to discuss factors that can explain the development.
b) You are in the leadership of a Norwegian firm. Do you consider the depreciation as good news for your firm?
c) Use a macroeconomic model to discuss the effect of the depreciation on aggregate production and private investment.
d) The government's considerations are that the Norwegian economy was in fair balance before the depreciation. The government wants to neutralize the change in the value of the currency such that the economy returns to its initial equilibrium. Which macroeconomic policy will you propose in this case?

a) The interest parity condition is an arbitrage relation stating that the expected rate of return of domestic and foreign bonds must be equal. The relative return depends on the interest rates in the countries, the exchange rate and the expected exchange rate in the future. It might be useful to be concrete and develop the relationship. It might be written different ways, for example

$$(1+i)=(1+i^*)\frac{E_t}{E^e_{t+1}} \quad or \quad (1+i)=(1+i^*)\frac{E}{\bar{E}^e} \quad or \quad E=\frac{(1+i)}{(1+i^*)}\bar{E}^e$$

The notation must be defined (see the textbook of the lecture notes for the notation above). Using the last expression above, it follows that there are three factors that can explain the depreciation of the Norwegian currency: Changes in the domestic interest rate, changes in the foreign interest rate, and changes in the expected future exchange rate. Reduced domestic interest rate compared to the foreign interest rate or reduced expected future exchange rate reduces E (depreciation).

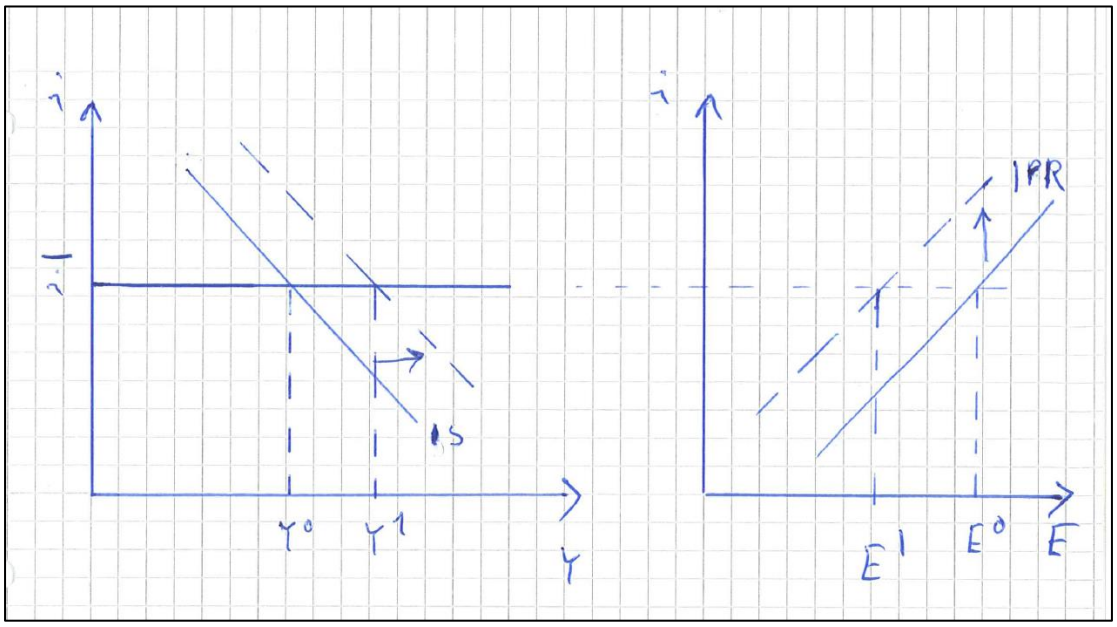
b) Firms might be either (i) export-oriented, (ii) import-oriented, or (iii) not exposed to the international market. In case (i) depreciation of the currency implies that the goods produced become relatively cheaper for foreign consumers. The demand for the firm's production increases, giving higher sales and more revenue, which are good news. In case (ii) depreciation of the currency implies that the importing firm must pay more in terms of the domestic currency for the goods in the foreign market, which are bad news. In case (iii), the exchange rate does not matter for the business.

c) It is expected that the candidate uses the IS-LM model for an open economy to answer the question. The model consists of three relations, and it is expected that they are developed and explained. The interest parity relation is discussed above. The LM-relation is in the textbook based on an assumption that the central bank sets the interest rate in the economy. It might be an advantage to provide some discussion of the money market. The most demanding relation to develop is the IS-relation. The discussion of the IS-curve is expected to include (see the textbook or the lecture notes for the notation)

- *The equilibrium condition. This states that equality between production and total demand in the economy. The demand in an open economy consists of private consumption, private investment, government spending, and the net export, which must be equal to the production. In form of an equation, $Y = C + I + G + (X – IM/\varepsilon)$.*

- *The consumption function. Total consumption in an economy depends on the private disposable income in the economy, which is production less taxes. In form of an equation, C = C(Y – T).*
- *The investment function. Total investment in an economy depends on the level of production and the interest rate. Explain why, and it is in particular important to explain that higher interest rate makes investments more costly; it is a negative relationship between the interest rate and investment.*
- *The net export function. It might be useful to discuss export and import separately. It should be concluded that net export decreases in domestic production and the exchange rate. It is not important to distinguish between nominal and real terms.*
- *It is sufficient to present the figure and give a verbal explanation of the included relations.*

The solution of the model is presented in the figure below. It is sufficient to present the figure and give a verbal explanation of the included relations. The initial equilibrium is $Y = Y^0$, $E = E^0$, and i is set by the central bank.



Then consider the depreciation. E is reduced. It is easiest to consider that the change is related to either a change in i^* or E^e, and not i. A change in i implies a change in monetary policy, and that is not mentioned in the question. The figure above illustrates a change in E for given i. It follows from the discussion above that the IS-curve shifts outwards when E decreases. The new equilibrium is $Y = Y^1$, $E = E^1$, and i is unchanged. The question is the effect on Y and I. Y increases (explain by words why). Investment is determined by i and Y. Given that Y increases, so does I.

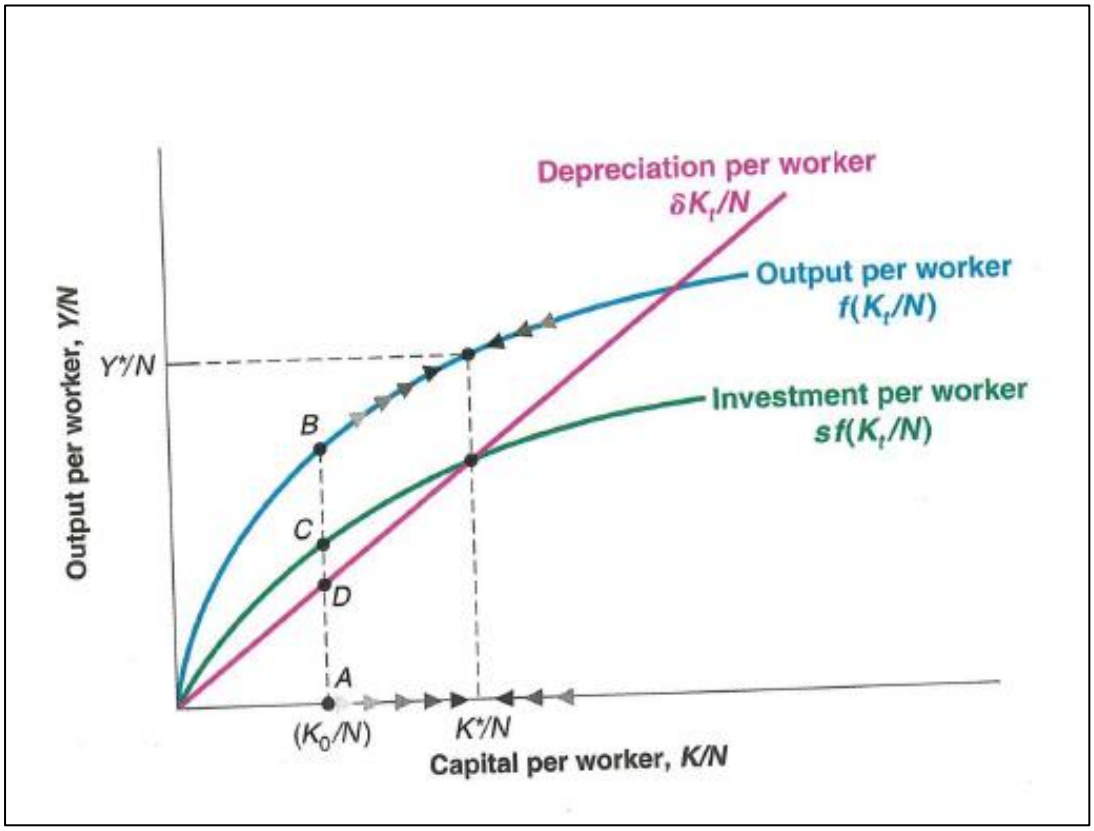
d) There are different ways to answer this question. The policies in the hand of the government are monetary policy and fiscal policy. Both policies can be used in order to reduce Y to its initial level Y^0. However, fiscal policy (shift inwards in the IS-curve) does not affect the exchange rate market and E does not return to its initial value. Monetary policy (shift upwards in the LM-curve) implies a change in the interest rate away from its initial value. One possible answer is to discuss fiscal and monetary policies separately in turn, using a figure to show the shifts in the IS- and LM-curves. Each policy can be used to get Y back to Y^0, but has other effects on the real economy (explain which).

Question 3 (30%)

The war in Ukraine implies massive destruction of buildings, plants, machines, and infrastructure in the country. Assume that the war will end and there will be a long-term peaceful situation. Discuss the consequences of the destruction on future economic growth and prosperity in the country.

The level of capital for production is reduced due to the war. Less inputs in production imply lower production than before the war. The question asks for long-term effects, and it is necessary to use a model for economic growth. Since the question is silent about technological progress and changes in population size, the easiest model to use is a model with a constant level of technology and fixed population size. These assumptions might be discussed, and it is possible to use other assumptions. Nevertheless, the important part is to explain the model and the mechanisms in the model.

It is expected that a growth model is developed. It can be done by use of mathematical expressions, but most important is to explain the figure below. Production per worker is increasing, but to a decreasing degree as the amount of capital per worker increases. Investment is equal to saving, and capital depreciates. When it is assumed a given saving rate and a given depreciation rate, as in the figure, it is useful that it is spelled out. Explain the equilibrium.



The change in the question is analyzed in the figure below. There is an initial situation (for K^0 and Y^0). Then the amount of capital per worker is reduced to K^1/N. Given that there is a peaceful situation, the fact that investment is larger than depreciation at $K = K^1$ implies that the amount of capital increases. This happens until the new equilibrium. In the figure, the new equilibrium is at the old equilibrium K^0 and Y^0). It is possible to discuss reasons why this might not happen. That is, arguments for higher or lower production per worker in the long term compared to the situation prior to the war.