# Exam: International Macroeconomics

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## Instructions

- Money market equilibrium

$$M^s = PL(R, Y)$$

- Foreign exchange market equilibrium

$$R = R^* + \frac{E^e - E}{E}$$

- Goods market equilibrium

$$Y = C(Y - T) + G + I + CA(EP^*/P, Y - T)$$

# 1 Equilibrium in the foreign exchange market [10]

a. Explain why the expected return to foreign assets, measured in domestic currency, is increasing in the depreciation rate.
*To invest abroad, the investor needs to convert domestic currency to foreign currency at the current exchange rate. When the investor receives the return to the foreign investment in foreign currency in the future, she uses the future exchange rate to convert it back. If the exchange rate has depreciated in the meantime, the investor receives more units of the domestic currency for every unit of the foreign currency than what she paid when the investment was made. Hence, at the time of the investment in foreign currency, the expected return is higher if the exchange rate is expected to depreciate.*

b. Assume that the dollar and euro interest rates equal 1% and 4%, respectively. The current dollar per euro exchange rate is 1 and is expected to equal .99 in a year. Based on this, should you invest in dollar or euro? Explain why in one sentence.

$$R_{\$} = 1\%$$
$$R_{EUR} = 0.04 + \frac{.99 - 1}{1} = 0.03 = 3\%$$

*The investor should invest in EUR because the expected return is higher.*

# 2 Joint equilibrium in the asset markets and the goods market [20]

a. Explain how the equilibrium in the money market and in the foreign exchange market generate a relationship between output and the exchange rate (known as the AA-curve). Give economic intuition behind the slope of the AA-curve.
*The money market equilibrium implies that, other things equal, higher output requires a higher interest rate. This is because higher output raises the real money demand. Since money supply is unchanged, the interest rate needs to rise to bring the money demand back down. The increase in the domestic interest rate spills over to the foreign exchange market, where equilibrium implies that, other things equal, a higher interest rate for the domestic asset goes hand in hand with a lower current exchange rate. This is because the increase in the domestic interest rate leads to excess demand for domestic currency, which drives down the price of foreign currency. Therefore, joint equilibrium in the asset markets implies that a higher output goes hand in hand with a lower exchange rate, as long as all other variables are constant. This relationship between output and the exchange rate is reflected in the AA curve, which is downward sloping in the $(E, Y)$ space.*

b. Explain how the equilibrium in the goods market generates another relationship between output and the exchange rate (known as the DD-curve). Give economic intuition behind the slope of the DD-curve.
*Equilibrium in the goods market obtains when demand for domestic goods equals supply. Demand depends positively on the current account, that is, net exports. The current account is assumed to increase in the real exchange rate. This is because a real depreciation makes domestic goods cheaper abroad and foreign goods more expensive at home. (Under certain conditions, the current account can also decrease in the real exchange rate, but an increase is more likely). Since prices are fixed in the short run, an increase in the real exchange rate corresponds to an increase in the nominal exchange rate. Hence, demand is increasing in the nominal exchange rate. In the short run equilibrium where prices are fixed, excess demand is satisfied by an increase in supply. Hence, short run output is increasing in the nominal exchange rate. This relationship is reflected in the DD curve, which is upward sloping in the $(E, Y)$ space.*

# 3 Stabilisation policies [20]

Suppose a temporary shock has pushed the country into a recession and policymakers and central bankers want to restore full employment. Would you recommend fiscal policy or monetary policy if

a. the initial shock was a negative shock to global demand for domestic output ? (Hint: in the AA-DD model, this initial shock shifts the DD curve left)

b. the initial shock was a positive shock to the demand for money ? (Hint: in the AA-DD model, this initial shock shifts the AA curve down)

Note:

- Explain your recommendations. You may (but don't have to) use the AA-DD model to illustrate the effects of the two policies graphically.

*a. Starting from point 2 in figure 2a (the short-run equilibrium with output $Y_2 < Y_f$), fiscal policy (e.g. $G \uparrow$) can restore the full employment at the initial exchange rate. In the figure, $G \uparrow$ moves the DD-curve from the location $DD_2$ (to which it was shifted by negative demand shock) back to location $DD_1$, where it intersects the initial AA curve $AA_1$, which was not affected neither by the initial demand shock nor by the fiscal policy. Monetary policy can also restore full employment. However, it can only do so by generating a depreciation. In the figure, expansionary monetary policy shifts the AA-curve from location $AA_1$ to location $AA_2$, where it intersects with the curve $DD_2$. I recommend fiscal policy, because it fully restores the initial equilibrium. In contrast, monetary policy will affect the exchange rate.*

*b. Starting from point 2 in figure 2b (the short-run equilibrium with output $Y_2 < Y_f$), fiscal policy (e.g. $G \uparrow$) can restore the full employment, but this comes at the cost of an appreciation. In the figure, $G \uparrow$ moves the DD-curve from the location $DD_1$ to location $DD_2$, where it intersects the new AA curve $AA_2$ at point 3, which was shifted there by the positive shock to money demand. At 3, E is lower than in the initial equilibrium (1). Monetary policy, however can also restore full employment at the initial exchange rate. In the figure, expansionary monetary policy shifts the AA-curve from location $AA_2$ back to the initial location $AA_1$, where it intersects with the initial curve $DD_1$, which was not affected by the money demand shock nor by the monetary policy. I recommend monetary policy in this case, because it fully restores the initial equilibrium. In contrast, fiscal policy will affect the exchange rate.*

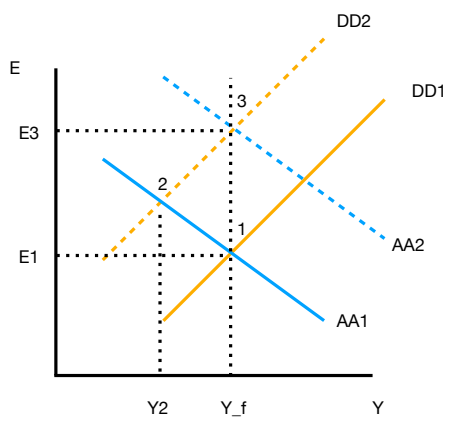


**Figure 2a**

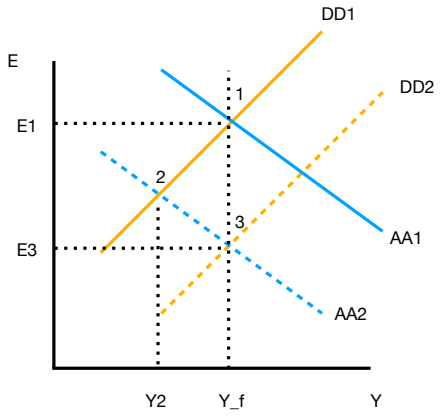


**Figure 2b**

# 4 Purchasing power parity [10]

Under purchasing power parity, long-run nominal exchange rates are determined by differences in the price levels across countries only. However, in the data this prediction only holds in special cases. What else can explain long-run changes in the nominal exchange rate?
*Long-run changes in the nominal exchange rate that are not fully explained n by changes in price levels are changes in the real exchange rate. Real exchange rate changes are caused by deviations in the relative demand for or relative supply of goods produced by two countries.*

# 5 Open-economy monetary trilemma [10]

What is the open-economy monetary trilemma? Using the trilemma, explain which desirable policy tool was sacrificed under the Gold Standard. Were there positive aspects of the Gold Standard as well?
*The trilemma is that out of three desirable properties of the open economy (exchange rate stability, monetary policy autonomy, free financial flows) only 2 can be fully achieved. For example, if the country wants to have free financial flows and a fixed exchange rate, it cannot use monetary policy to influence output and the price level. This is was the case under the Gold Standard. Money supply needed to adjust freely to satisfy demand for domestic currency at the price fixed in terms of gold. Deliberate changes in the money supply, e.g. an increase in $M^s$ aiming at a lower interest rates and a stimulation of output, would have led to decline in the price of currency in terms of gold because investors would have sold the domestic currency and carried the gold abroad. A decline in the in price of currency in terms of gold, however, would have violated the central bank's promise to hold this price fixed. Alternatively, the country could have banned exports of gold. But this would have been a violation of the freedom of capital flows. The most noteworthy positive aspect of the gold standard was low inflation (since the world money supply could not grow by more than world output). Moreover, in contrast to fixed exchange rate systems based on a reserve currency or the current system with mainly floating rates and the dollar as the main reserve currency, no country occupied a special position in the international monetary system.*

# 6 Capital flight and currency crisis [10]

Explain how an expected change in the fixed exchange rate can trigger a currency crisis (i.e., a situation where the central bank rapidly loses foreign reserves). Is it an expected devaluation or revaluation that can cause such as crisis ? *An expected devaluation of the domestic currency can trigger a balance of payments crisis. This is because an expected devaluation increases the expected return to investing in foreign-currency denominated bonds, which leads investors to exchange domestic currency against foreign currency at the central bank. This makes it even more likely that the central bank has to devalue the currency, because this is the only way it can stop investors from buying up all of its reserves, the more likely the depreciation becomes, the higher the expected return to investing in foreign-currency-denominated assets. Hence, this is a self-enforcing process.*

# 7 Current account [10]

Are large current account deficits problematic? What about surpluses? Discuss.
*Possible answers (not exhaustive):*

- *Large current deficits can signal economic problems. For example, that the government is accumulating debt in order to raise current consumption at the cost of lower consumption in the future. There is also a risk of sudden stops, which means that foreign investors might suddenly*

*withdraw their investments from the domestic economy, causing an abrupt decline in consumption. However, large deficits can also be a signal for good investment opportunities in the domestic economy, like, for example, the investment in oil production facilities in Norway.*

- *Large current account surpluses can simply reflect a desire to save for the future, e.g. because the population is getting older. However, it can also signal economic problems. If the country does not have good investment opportunities to offer, investors will rather want to invest abroad. Similarly, investors might just be avoiding domestic taxation. Moreover, larger net asset holdings abroad expose the country to the risk of a default by the borrowing country.*