Exercise Sheet 1

1. Assume you calculate Austrian GDP by summing up value added in the economy during a given period. Determine how the following transactions influence GDP:

   (a) You buy fish worth 100 Euros from an Austrian fisherman, which you cook at home and eat.

   (b) An Austrian restaurant buys fish from the same fisherman worth 100 Euros.

   (c) Austrian Airlines buys a new airplane from Airbus-Austria worth 200 million Euros.

   (d) China Airlines buys a new airplane from Airbus-Austria worth 200 million Euros.

   (e) Austrian Airlines sells one of its airplanes to Mr Maier from Graz for 100 million Euros.

2. An economy produces three goods: cars, computers and apples. The following table states the quantities and prices per unit of the goods for the years 2010 and 2011:

	quantities	prices 2010	quantities	prices 2011
cars	10	2000	12	3000
computers	4	1000	6	500
apples	1000	1	1000	1

   (a) Determine nominal GDP in the years 2010 and 2011. By how much (percent) did it increase between 2010 and 2011?

   (b) Determine real GDP at 2010 prices for the years 2010 and 2011. By how much (percent) did real GDP increase between 2010 and 2011?

   (c) Determine real GDP at 2011 prices for the years 2010 and 2011. By how much (percent) did real GDP increase between 2010 and 2011?

   (d) Why did you get different growth rates in (b) and (c)? Which one is the correct answer? Give reasons.

   (e) Calculate real GDP for the years 2010 and 2011 by using average prices of the two years as a basis.

   (f) Calculate the GDP-deflator for the years 2010 and 2011. Determine the inflation rate.

3. Assume an economy given by the following equations:

$$\begin{aligned} C &= 160 + 0.6Y_V \\ I &= 150 \\ G &= 150 \\ T &= 100 \end{aligned}$$

Calculate:

(a) GDP in equilibrium (Y).

(b) Disposable income (Y_V).

(c) Consumption (C).

(d) Production and total demand in equilibrium. Are those the same?

(e) Production and total demand for the case in which G decreases to 110. Does procuction change?

(f) For the values in (e), calculate private and public savings and check whether this is equal to investment.

4. A closed economy is given by the following goods market model:

$$\begin{aligned} Y^s &= Y \\ Z &= C + I + G \\ C &= 200 + 0.5(Y - T) \end{aligned}$$

where Y^s is goods supply, Z goods demand and Y is GDP. C is household consumption, T are direct taxes, G government expenditures and I investments. In the initial situation, $I = 500$ and the goods market is in equilibrium.

(a) Calculate income in equilibrium for the cases (i) $T = G = 200$ and (ii) $T = G = 0.2Y$.

(b) Assume that equilibrium observes a shocks and investment decreases by 150. Compare the possible changes of equilibrium income for the cases (i) and (ii).

(c) Explain the savings paradox. Determine the paradox from the goods market model and provide its economic intuition.

5. What is the impact of changes in G and T if the public household remains balanced? Assume

$$Y = c_0 + c_1(Y - T) + \bar{I} + G$$

   (a) Calculate the change in Y if G increases by one unit.

   (b) Calculate the change in Y if T increases by one unit.

   (c) Why do we get different answers in (a) and (b)?

   (d) Calculate the change in Y if G and T increase by the same amount. (Haavelmo Theorem)

6. Assume the following:

   - Household do not hold any cash.
   - The relation between reserves and checkable deposits is 0.1.
   - The demand for money is given by: $M^d = PY(0.8 - 4i)$

   The initial money basis is 100 billion Euros and nominal income is 5000 billion Euros.

   (a) Calculate the demand for central bank money.

   (b) Determine the equilibrium interest rate by equating demand and supply for central bank money.

   (c) Calculate total money supply. Is this equal to demand for money at the intest rate that you caluclated in (b)?

   (d) What is the impact on interest rate if central bank money is increased to 300 billion Euros?

   (e) If total money supply increases to 3000 billion Euros, what impact does this have on the interest rate?

7. Assume the following money demand function:

$$M^d = PY(0.35 - i)$$

Assume that income is 100 Euros and money supply is 20 Euros. All financial and money markets are in equilibrium.

(a) Determine the interest rate.

(b) If the central bank wants to increase the interest rate by 10 percentage points, what money supply does it need to choose?

8. Assume the real money demand function to be given as $(\frac{M}{P})^d = 1000 - 100i$, where i denotes the interest rate (in percent). Money supply is $M = 1000$ and the price level $P = 2$.

(a) Draw real money supply and demand in an appropriate picture.

(b) Calculate the equilibrium interest rate.

(c) What happens with the equilibrium interest rate if you assume constant prices and money supply increases from 1000 to 1200?

(d) If the central bank wants to increase the interest rate to 7 percent, what money supply does it need to choose?