

Übung zur Makroökonomie: Aufgabenblatt 1 (Volkswirtschaftliche Gesamtrechnung)

1. Wodurch unterscheiden sich Bestands- und Stromgrößen, und welcher Zusammenhang besteht zwischen ihnen?

2. In einer geschlossenen Wirtschaft treten folgende Zahlungsströme auf:

Lohnzahlungen der Unternehmen an die Haushalte: 175

Lohnzahlungen des Staates an die Haushalte: 25

Lohnsteuersatz: 10%

Gewinnausschüttung der Unternehmen an den Staat: 5

Durchschnittliche Konsumneigung: $2/3$

Die Abschreibungen sind gleich null.

Stellen Sie die angegebenen Zahlungsströme mithilfe eines Kreislaufdiagrammes sowie in Matrixform dar und berechnen Sie die Investitionen, den privaten Konsum und das Volkseinkommen.

3. In einer Wirtschaft bestehend aus dem Unternehmenssektor, dem Haushaltssektor und dem Staat treten folgende Zahlungsströme auf:

Lohnzahlungen der Unternehmen an die Haushalte: 150

Gehaltszahlungen des Staates an die Haushalte: 50

Lohnsteuersatz: 10%

Konsumneigung der Haushalte: $2/3$

Käufe des Staates von Gütern des Unternehmenssektors: 20

Gewinnsteuersatz: 50%

Unverteilte Gewinne vor Steuerabzug: 20

Bestimmen Sie den privaten Konsum, die privaten Investitionen, das staatliche Defizit und das Bruttonationalprodukt. Stellen Sie die Zahlungsströme mithilfe eines Kreislaufdiagrammes und in Matrixform dar.

4. Wir betrachten eine Wirtschaft mit zwei Sektoren, Industrie und Landwirtschaft. Im Beobachtungszeitraum haben folgende Transaktionen stattgefunden:

A. Verkäufe der Industrie an:

Landwirtschaft: 37; private Haushalte: 65; öffentliche Haushalte: 10; Investitionsgüter: 20; Ausland: 38

B. Verkäufe des landwirtschaftlichen Sektors an:

Industrie: 41; private Haushalte: 104; öffentliche Haushalte: 10; Investitionsgüter: 27; Ausland: 18

C. Sonstige Transaktionen:

Importe: Industrie: 36; Landwirtschaft: 22

Abfuhr indirekter Steuern: Industrie: 20; Landwirtschaft: 14

Abschreibungen: Industrie: 10; Landwirtschaft: 12

Berechnen Sie den gesamten Output, die Wertschöpfung, Brutto- und Nettonationalprodukt, Nettoexporte. Stellen Sie die verschiedenen Stromgrößen mithilfe einer Input-Outputtabelle dar. Stellen Sie weiters das Produktionskonto der Industrie, der Landwirtschaft und das aggregierte Produktionskonto dar.

5. Diskutieren Sie, ob das BNP ein geeigneter Wohlstandsindikator ist. Wie sind internationale Vergleiche des BIP pro Kopf zu beurteilen? (Siehe Tab. 1.2 Stat. Jahrb.)

6. Eine Wirtschaft hat folgende Mengen zu folgenden Preisen produziert:

Jahr	p ₁	p ₂	p ₃	q ₁	q ₂	q ₃
1993	5	3	10	100	200	20
1994	4	3	9	120	200	30
1995	5	4	8	110	180	40
1996	6	5	7	100	170	50

Berechnen Sie: Das nominelle BNP für jedes Jahr und seine jährliche Wachstumsrate. Das reale BNP für jedes Jahr zu Preisen von 1993 und seine Wachstumsraten. Den BNP Deflator. Einen Laspeyres-Preisindex. Erklären Sie, warum ein Laspeyres-Index die Inflationsrate über- und ein Paasche-Index sie unterschätzen kann!

7. (Dipl.Prüfung Juli 1998) Dem statistischen Jahrbuch sind für 1997 folgende Daten (in Mrd. ö.S.) zu entnehmen:

Bruttoentgelte für unselbständige Arbeit:	1276
(davon: Lohnzahlungen des Staates:	252)
private Einkünfte aus Besitz u. Unternehmung (einschließlich der unverteilter Unternehmensgewinne, vor Steuerabzug, in Höhe von 143; vermindert um die Zinsen für die Konsumentenschuld):	623
Einkünfte des Staates aus Unternehmungen (vermindert um die Zinsen für die Staatsschuld):	-64
indirekte Steuern:	410
Subventionen:	76
Abschreibungen:	344
Exporte:	1061
Importe:	1077
Konsum der privaten Haushalte:	1412
Öffentlicher Konsum:	487
(davon Ausgaben des Staates für Vorleistungen:	235)
Bruttoanlageinvestitionen und Lagerveränderungen der Unternehmen:	634
direkte Steuern der Haushalte (abzüglich Transferzahlungen an die HH):	100
Gewinnsteuern der Unternehmen:	41

Die Größen zur Verteilungsrechnung entsprechen dem Inländerkonzept, die zur Verwendungsrechnung dem Inlandskonzept. Investitionen und Abschreibungen des Staates sind null.

a) Bestimmen Sie das Volkseinkommen (NNP zu Faktorkosten), das Bruttonationalprodukt (BNP) sowie das Bruttoinlandsprodukt (BIP). Worauf ist der Unterschied zwischen BIP und BNP zurückzuführen und wie hoch ist er?

Hinweis: Das BIP ergibt sich aus der Verwendungsrechnung, während das BNP hier aus der Verteilungsrechnung abzuleiten ist.

b) Stellen Sie die angegebenen Zahlungsströme mithilfe eines Kreislaufdiagrammes dar. Berechnen Sie den Beitrag, den die verschiedenen Komponenten der gesamtwirtschaftlichen Ersparnis bei der Finanzierung der Investitionen der Unternehmen leisten.

Hinweis: Gehen Sie von den 'üblichen' fünf Polen aus und ordnen Sie die Zahlungsströme entsprechend zu. In Zweifelsfällen begründen Sie bitte Ihre Zuordnung. Der in a) bestimmte Saldo zwischen BIP und BNP stellt eine Komponente der Finanzierung der Investitionen der Unternehmen dar. Im Kreislaufdiagramm ist er zwischen Unternehmens- und Auslandspol bzw. Auslands- und Vermögensänderungspol zu buchen.

8. Die Transferbilanz einer Volkswirtschaft weist ein Defizit von 10 Einheiten auf, das Handelsbilanzdefizit beträgt 30 Einheiten. Der Bestand an offiziellen Währungsreserven hat im Beobachtungszeitraum um 10 Einheiten zugenommen. Wie hoch ist der Saldo der Kapitalbilanz bzw. die Veränderung des Nettoauslandsvermögens? Liegt ein Kapitalimport oder ein Kapitalexport vor?

Literatur: Haslinger, "Volkswirtschaftliche Gesamtrechnung", letzte Aufl., Oldenbourg, insbesondere S.1-66, plus Zahlungsbilanz und Input Output Tabelle.

Makroökonomie: Aufgabenblatt 2

(Gütermarkt – Blanchard, Kapitel 3, 4.1, 6.1)

1. What is the difference between endogenous and exogenous variables?
2. Explain in words and grafically the effect that an increase in autonomous spending has on output in our model of the goods market.
3. Suppose that an economy is characterized by the following behavioral equations:
 $C = 100 + 0.6Y_D$; $I = 50$; $G = 250$; $T = 100$
 Solve for:
 - a) Equilibrium income (Y)
 - b) Disposable income (Y_D)
 - c) Consumption spending (C)
 - d) Private saving
 - e) Public saving
 - f) The multiplier
 Verify that in equilibrium:
 Production equals demand.
 Total saving equals investment.
4. Consider the economy of exercise 3 and suppose that the government wishes to increase equilibrium income by 100.
 - a) What change in government spending is required?
 - b) If government spending cannot change, what change in taxes is required?
5. Consider the following dynamic model of the goods market:
 $C_t = 50 + 0.75(Y_t - T)$; $I = 25$; $G = 150$; $T = 100$; $Z_t = C_t + I + G$; $Y_{t+1} = Z_t$
 - a) Solve for equilibrium income, under the assumption that it is constant.
 - b) Suppose that the economy is in equilibrium, and then government spending decreases by 100 in period t . Construct a table showing what happens to consumption (C), demand (Z), and output (Y) in periods t , $t+1$, and $t+2$.
 - c) Plot income and demand over time, from t to $t+2$.
 - d) When output eventually returns to a new constant value, what are the values of income, demand, and consumption?
 - e) How many periods must pass before 75% of the ultimate decrease in output has occurred?
6. For $Y = C + I + G$ with $I = 0$, $C = c_0 + c_1 Y_D$, $Y_D = (1-t)Y$, t ... tax rate
 - a) Give an expression that relates private saving S , to Y_D (this is called the saving function).
 - b) What is the relation between private saving and the budget deficit?
 - c) Derive an expression for S and the budget deficit such that each is only a function of the exogenous variable G and the constants. Compare to b).
7. What is the IS curve? How do we construct it? What does a point on the IS curve mean?
8. What happens to the IS curve if
 - a) government increases (decreases) taxes T ?
 - b) government increases (decreases) spending G ?
 - c) the interest rate rises (falls)?

Makroökonomie: Aufgabenblatt 3

(Finanzmärkte – Blanchard, Kapitel 5, 6.2)

1. Questions:

- a) What is the difference between the following terms when we use them in Macroeconomics?
Income, saving, wealth, investment and financial investment
 - b) What does the term velocity of money mean?
 - c) What is an open market operation? What is an expansionary open market operation, and what a contractionary open market operation?
 - d) Assume a bond will pay \$1,000 in one year. What is the interest rate of the bond if the price today is \$700? \$800? \$900? Is the relationship between the price of a bond and the interest rate on that bond positive or negative? What would the price have to be for the bond to pay an interest rate of 10 percent?
2. Suppose that a person with wealth of \$25,000 and a yearly income of \$50,000 has a demand-for-money function given by $M^d = Y(0.5 - i)$ with $i < 0.5$.
- a) What is the person's demand for money when the interest rate is 5 percent? 10 percent?
 - b) What is the person's demand for bonds when the interest rate is 5 percent? 10 percent?
 - c) Summarize your results by stating the impact of a rise in the interest rate on the demand for money and the demand for bonds.
 - d) Assuming that the demand for money is equal to the supply of money (M), find an expression for velocity at any given interest rate. Use the expression to determine the impact on velocity of a rise in the interest rate.
3. Suppose the public holds no currency, the ratio of reserves to deposits is 0.2, and the demand for money is given by $M^d = Y(0.2 - 0.8i)$. Initially, the monetary base is \$100 billion and nominal income is \$5,000 billion.
- a) Determine the value of the money supply.
 - b) Determine the equilibrium interest rate.
 - c) Determine the impact on the interest rate if the central bank increases the monetary base to \$150 billion.
 - d) With the original money supply, determine the impact on the interest rate if nominal income increases from \$5,000 billion to \$6,250 billion.
 - e) Assume now that the public wants to hold currency. In particular, assume that the ratio of currency to deposits is 0.43. Determine now the value of the money supply when the monetary base is \$100 billion. What is now the value of the money multiplier? Explain the chain of effects on the money supply if the central bank decided to run an expansionary open market operation of \$50 billion.
4. What is the LM curve? How do we construct it? What does a point on the LM curve mean?
5. What happens to the LM curve if the nominal money stock a) rises b) falls (Assume that the price level does not change)? What happens if the interest rate rises (falls)?

Makroökonomie: Aufgabenblatt 4

(IS-LM – Blanchard, Kapitel 6)

Exercise 1: Changes in the basic model. The IS revisited.

1. Assume that taxes are increasing with income, and that investment is increasing with income and decreasing with the interest rate. For simplicity, assume that all behavioral functions are affine functions.
 $T = t_0 + t_1 Y$; $I = I_0 + I_1 Y - I_2 i$; $C = c_0 + c_1 (Y - T)$; G exogenous
 Construct the IS curve. What determines the slope of the IS curve? What determines the position of the IS curve, given its slope, and what causes the curve to shift?
2. Consider the possibility that the interest rate might affect consumption spending. An increase in the interest rate could, in principle, lead to increases in saving and therefore a reduction in consumption, given the level of income. Suppose that consumption were in fact reduced by an increase in the interest rate. For simplicity, assume that both consumption and investment expenditure are affine functions, and that taxes and government spending are exogenous. How would the IS curve be affected?

Exercise 2: Changes in the basic model. The LM revisited.

Suppose that the money supply, instead of being constant, increased (slightly) with the interest rate.

- a) How would this change affect the construction of the LM curve?
- b) Could you see any reason why the central bank might follow a policy of increasing the money supply along with the interest rate?

Ex 3: IS-LM model, fiscal policy and monetary policy.

Consider the following numerical version of the IS-LM model:

$$C = 400 + 0.5Y_D; \quad I = 700 - 4,000i + 0.1Y; \quad G = 200; \quad T = 200; \quad (M/P)^d = 0.5Y - 7,500i; \quad (M/P)^s = 500$$

Try to keep decimals in the form of simple fractions to avoid approximation problems.

- a) Find the equations for the IS and the LM curves respectively.
- b) Solve for equilibrium real output and equilibrium interest rate.
- c) Solve for the equilibrium values of consumption spending, and investment spending.
- d) Now suppose that government spending increases by 500. What are the effects on Y , i , C and I ?
- e) Set all variables back to their initial values. Now, suppose that the money supply increases by 500. What are the effects on Y , i , C and I ?

Questions

Ex 4) What is a *fiscal contraction*? Which way would investment change after a fiscal contraction? State your assumptions clearly.

Ex 5) What is a *monetary expansion*? Do monetary expansions affect investment? If so, in which way?

Ex 6) Suppose that policy makers want to decrease the deficit while guaranteeing that there will be no decrease in either output or investment spending. Is there any fiscal-monetary *policy mix* that can achieve this goal?

Ex 7) Assume that production adjusts slowly to a change in sales, while interest rates adjust very quickly to changes in the supply and demand in financial markets. What sequence of events can we expect after an *expansionary fiscal policy*?

Ex 8: Eine geschlossene Volkswirtschaft sei durch das folgende Modell gegeben: $C = a + bY^d$ (C Privater Konsum, Y^d verfügbares Einkommen) $Y^d = Y - T + Z$ (T Kopfsteuer, Z Transferzahlungen an Haushalte, Y Sozialprodukt brutto) $I = e - dR$ (I Investitionen, R Zinssatz) $G =$ exogen gegebene Staatsausgaben ausgenommen Transferzahlungen $M/P = kY$ (Geldnachfragefunktion; Geldmenge M und Preisniveau P exogen gegeben)

- a) Stellen Sie die *IS* und die *LM* Funktion dieses Modells auf und illustrieren Sie diese graphisch. Tragen Sie die Auswirkungen einer Erhöhung des Geldangebots in die Graphik ein und kommentieren Sie das Ergebnis.
- b) Angenommen zum Zweck der Budgetsanierung werden die Steuern erhöht und die Transferzahlungen gesenkt: Zeigen Sie die kurzfristigen Auswirkungen dieser beiden Maßnahmen auf das Sozialprodukt und kommentieren Sie das Ergebnis.

Makroökonomie: Aufgabenblatt 5

(Erwartungen, Konsum und Investitionen – Blanchard, Kapitel 7 und 8)

Exercise 1: Nominal vs. Real Interest Rate.

- 1) Define *nominal* interest rate and *real* interest rate. Can real interest rate ever be negative? Under what circumstances? Explain in words what this implies about borrowing and lending.
- 2) For each of the following, calculate the *exact* real interest rate and the *approximate* real interest rate.
 - a) $i_t = 6\%$; $\pi_t^e = 1\%$
 - b) $i_t = 10\%$; $\pi_t^e = 5\%$
 - c) $i_t = 50\%$; $\pi_t^e = 45\%$
- 3) Suppose that the monthly inflation rate in a country is expected to remain constant at 30%. What is the rate of inflation per year? If the yearly nominal interest rate is 2,340%, calculate the yearly real interest rate using both the exact formula, and the approximation formula.

Exercise 2: The very foresighted consumer.

Consider the consumption problem that faces a very foresighted college student today on the basis of expected lifetime income. Assume that he is 21 years old, with three more years of college before he takes his first job. His starting salary should be around \$40,000 (in real terms) and will increase by an average of 3% a year in real terms until retirement at age 60. About 25% of his income will go to taxes. Assume that his debt and possessions add up to zero (zero nonhuman wealth.) Assume that the real interest rate is constant, and equal to 2%, and that expected life after retirement is 16 years, so that his expected remaining life today is 56 years. What is the permanent consumption level that this college student could sustain under those circumstances?

Exercise 3: Investment

Suppose firms expect both future profits (per unit of capital) and future interest rates to remain constant at the same level as today's levels where $r_t = 5\%$ and $\Pi_t = \$10,000$. Assume that $\delta = 10\%$. Note: when calculating PV, let $r = .05$ when $r = 5\%$ and $\delta = .10$ when $\delta = 10\%$.

- a. Given this information, calculate the PV of expected profits. What is the highest price the firm would be willing to pay for this machine? What is the user cost of capital?
- b. Repeat the analysis in part (a). This time, however, assume that $r_t = 4\%$. What happens to the user cost of capital as the real interest rate falls?
- c. Repeat the analysis in part (a). This time, however, assume that $\delta = 12\%$. What happens to the user cost of capital as a result of this change in the depreciation rate?
- d. Repeat the analysis in part (a). This time, however, assume that $\Pi = \$9,000$. What happens to the user cost of capital?
- e. Based on your analysis, what would tend to happen to investment in parts (b), (c) and (d) as a result of these changes?

Exercise 4*: (Makrofrage Dipl.prfg. Herbst '95)

Welche der folgenden beobachtbaren Fakten ist mit der „forward-looking theory of consumption“ (darunter fällt auch die Lebenszyklushypothese des Konsums) vereinbar? Begründen Sie Ihre Antworten.

- Die Grenzneigung zum Konsum ist bei permanenten Einkommenserhöhungen niedriger als die bei temporären Einkommenserhöhungen.
- Der laufende Konsum reagiert nicht nur auf Veränderungen des laufenden Einkommens, sondern auch auf Änderungen im erwarteten zukünftigen Einkommen.

Exercise 5:

Using the IS-LM model, determine the impact on C , I , Y , i (nominal interest rate), and r (real interest rate) for each of the following: A decrease in expected inflation. A decrease in expected inflation combined with a contractionary monetary policy.

(Expectations, Policy and Output – Blanchard, Kapitel 10)

- 1) For each of the following, determine whether the IS curve, the LM curve, both, or neither will shift. In each case, assume that expected current and future inflation is equal to zero, and that no other exogenous variables are changing.
 - b) An increase in expected future taxes
 - c) An increase in the expected future interest rate
 - d) An increase in the current interest rate
 - e) An increase in current output
 - f) An increase in the current money supply
- 2) "If a credible, phased-in deficit reduction is announced, and if the Central Bank is expected to keep the same interest rate in the future as was expected before the announcement, the IS curve must shift leftward and both output and the interest rate must fall." (By "phased-in," we mean a program that is implemented piece by piece over the course of several years.) Discuss this statement. Is it true or false? Why? (Assume that the statement is not correct - that the IS curve shifts rightward- and obtain a contradiction.)
- 3) A new president -who promised during the campaign that she would decrease future income taxes- has just been elected. Assume that people trust that the new president will keep her promise. Using the IS-LM model with only two periods (current and future) and zero expected current and future inflation, determine the impact on current output, the current interest rate, and current private spending, under each of the following assumptions:
 - a) The Central Bank does nothing
 - b) The Central Bank will act to prevent any change in current and future output
 - c) The Central Bank will act to prevent any change in the current and future interest rate

Makroökonomie: Aufgabenblatt 6

(Openness – Blanchard, Kapitel 11, 12 und 13)

Questions 1

1. Define *nominal* and *real exchange rate*. What is a *real appreciation* and a *real depreciation*?
2. What is the *uncovered interest parity condition*? What does it imply in terms of the domestic interest rate and the foreign interest rate?

Exercise 1: Exchange rate, appreciation and depreciation.

Suppose that it takes 5 French francs to buy a dollar, the price level in France is 1.2, and the price level in the United States is 1.5.

- a) What is the *real* exchange rate between the United states and France?
- b) What would happen to the real exchange rate if the dollar rose to 8 French francs?
- c) Comparing your answers in parts a) and b), is this a real *appreciation* or a real *depreciation* of the dollar? Of what percentage?

Exercise 2: Uncovered interest parity condition.

Suppose the following:

- i. The interest rate in the United States is 6%.
 - ii. The interest rate in Japan is 1%.
 - iii. The current nominal exchange rate (dollar price of a yen) is 0.01.
 - iv. The expected nominal exchange rate next year is 0.011.
- a) How many dollars would a U.S. resident expect to earn for each dollar invested in Japanese bonds for one year?
 - b) Ignoring risk and transaction costs, should a U.S. resident prefer to invest in U.S. or Japanese bonds?
 - c) How many yen would a resident of Japan expect to earn for each yen invested in U.S. bonds for one year?
 - d) Ignoring risk and transaction costs, should a resident of Japan prefer to invest in U.S. or Japanese bonds?
 - e) What is the expected rate of appreciation or depreciation of the dollar? (State which.)
 - f) Show that the data in i.-iv. are not consistent with uncovered interest parity. [Use the approximation formula.]

Questions 2

3. What is the difference between the *demand for domestic goods* and the *domestic demand for goods*? Which one is more relevant for the construction of the IS curve of an open economy?
4. What does the *Marshall-Lerner condition* state? What does it imply in case of a real depreciation? A major depreciation may lead to strikes and riots in the streets, since it raises the prices of imported goods and thus the cost of living. Why, then, wouldn't a government want to pursue the opposite policy: a major appreciation?

Exercise 3: The market for goods in an open economy.

Suppose that the goods market in an open economy is characterized by the following behavioral equations:

$$C = 400 + 0.5Y_D; \quad I = 700 - 4,000i + 0.2Y; \quad X = 100 + 0.1Y^* + 100\epsilon; \quad Q = 0.1Y - 50\epsilon$$

$$G = 200; \quad T = 200; \quad \epsilon = 2.0; \quad Y^* = 1,000$$

where X is the quantity of exports, Q the quantity of imports, ϵ the real exchange rate, and Y^* the foreign output.

- a) Assuming that the interest rate is 10%, find equilibrium GDP.
- b) Determine the values of C, I, G, and net exports, and verify that the demand for domestic goods is equal to the value you found in part a).
- c) Suppose that government spending increases from 200 to 400.
 - i) Solve again for equilibrium GDP.
 - ii) Solve for C, I, G, and net exports, and verify the equality of the demand for domestic goods and GDP.
 - iii) What has happened to net exports as a result of the increase in G? Explain.
- d) Go back to the original assumptions of this problem. Continue to assume that the interest rate is 10%. Now, suppose that foreign output increases from 1,000 to 1,200.
 - i) Solve again for equilibrium GDP.
 - ii) Solve for C, I, G, and net exports, and verify that the demand for domestic goods equals GDP.
 - iii) What has happened to net exports? Explain why the answer is different from the one you obtained when government spending increased in the same amount.

Exercise 4: Fiscal policy in an open economy.

What combination of fiscal policy and exchange-rate changes should the government pursue if it wants to:

- a) Increase output while improving the trade balance?
- b) Decrease output while improving the trade balance?

Exercise 5: Financial markets in an open economy.

- 1) Suppose that the interest parity condition holds and the expected exchange rate between the French franc and the U.S. dollar in one year is 0.2 (20 cents per franc). Determine the current exchange rate for the following pairs of annual interest rates:
 - a) France, 7%; U.S., 5%
 - b) France, 7%; U.S., 7%
 - c) France, 7%; U.S., 9%
- 2) Suppose that the German interest rate is 6%, the U.S. interest rate is 2%, and the exchange rate is 0.7 dollars per DM. If interest parity holds:
 - a) What is the exchange rate expected to be one year from today?
 - b) Is the dollar expected to appreciate or depreciate? By what percentage?
- 3) Suppose that an investor regularly invests in foreign bonds and cares only about expected return, not risk. If interest parity holds, would she prefer a fixed exchange rate, freely fluctuating exchange rates, or neither?
- 4) Suppose that, initially, the U.S. and German interest rates are equal. Interest parity implies that a rise in the U.S. interest rate will lead to an appreciation of the dollar. But then the U.S. interest rate will be higher than the German rate, and this is only possible when people expect a depreciation of the dollar. Is this a contradiction? Explain.

Exercise 6: IS-LM model, fiscal policy, and monetary policy in an open economy.

Suppose that a formerly closed economy becomes open. What will happen to the effectiveness of fiscal and monetary policy in affecting GDP if the economy operates under flexible exchange rates? (Answer separately for fiscal and monetary policy.)

Questions 3

5. "The United States cannot eliminate its trade deficit until it eliminates its budget deficit." Comment.
6. Under fixed exchange rates, a fear of devaluation can lead to a recession. Explain.

Exercise 7:

- a) Nehmen Sie an, daß einerseits das Vollbeschäftigungsniveau in der österreichischen Wirtschaft erreicht ist, daß aber andererseits der Schilling überbewertet und das Außenhandelsdefizit zu groß ist. Beschreiben Sie im Rahmen einer kurzfristigen Analyse fiskal- und geldpolitische Maßnahmen, welche bei Aufrechterhaltung des Vollbeschäftigungs-niveaus eine Reduktion des Außenhandelsdefizits und eine Abwertung des Schillings bewirken würden. Illustrieren Sie Ihre Ausführungen mithilfe eines IS-LM Diagramms. Ist diese Politik durchführbar, wenn die Nationalbank den nominellen Wechselkurs fixiert? Begründen Sie Ihre Antwort!
- b) Nehmen Sie an, daß in der italienischen Wirtschaft einerseits das Vollbeschäftigungsniveau erreicht ist, daß aber andererseits die Inflationsrate als zu hoch empfunden wird. Um die Inflationsrate zu reduzieren ist offensichtlich eine kontraktive Wirtschaftspolitik notwendig. Beschreiben Sie die Vor- und Nachteile, die sich bezüglich der außenwirtschaftlichen Auswirkungen ergeben, wenn man diese Kontraktion mithilfe der Fiskalpolitik bzw. mithilfe der Geldpolitik herbeiführt.

Makroökonomie: Aufgabenblatt 7

(The Labor Market, Putting All Markets Together – Blanchard, Kapitel 15 und 16)

- 1) Consider a *wage-setting equation* of the form

$$W = P^e F(u, z)$$

(–, +)

where W stands for the aggregate nominal wage, P^e for the expected level of prices, u is the unemployment rate, and z stands for other factors that may affect wages.

What does this equation say? Why does the price level affect wages? Why precisely the expected price level? Why does the unemployment rate affect wages? What other factors could affect the determination of wages?

- 2) Consider a *price-setting equation* of the form

$$P = (1 + \mu) W$$

where P is the price of a unit of output, W is the aggregate nominal wage level, and μ is what we call the markup of price over cost. What does this equation say? Under what conditions would $P = W$?

- 3) Consider the *wage-setting* and the *price-setting equations* of the previous two questions. Assume that in wage determination, nominal wages depend on the actual price level, P , rather than on the expected price level, P^e . Show that
- Wage determination implies a negative relation between the real wage, W/P , and the unemployment rate, u .
 - Price determination implies that the real wage is constant, and thus independent of the unemployment rate, u .
- 4) Explain: the natural (structural) rate of unemployment, the natural level of employment, the natural level of output?
- 5) Suppose that the firm's markup over costs is 10%, and that the wage-determination equation is $W = P(1 - u)$, where u is the unemployment rate.
- What is the real wage as determined by the price-setting equation
 - What is the natural rate of unemployment?
 - Suppose that the markup over costs increases to 20%. What will happen to the natural rate of unemployment? Explain the logic behind your result.
- 6) For each of the following changes, state which curve or curves are affected initially (IS, LM, AS, and AD) and in which direction they will initially shift.
- An increase in government spending, b) An increase in the nominal money supply. c) An increase in the price of oil, d) A decrease in consumer confidence
- 7) Suppose that unemployment benefits are increased permanently.
- What will happen in the long run? Illustrate with the:
 - AD and AS diagram. ii) wage-setting and price-setting diagram.
 - What will happen in the short run? Illustrate with the:
 - AD and AS diagram. ii) IS-LM diagram.
- 8) Suppose that the IS curve would be vertical. What would this imply about economic behavior? What would the aggregate demand curve look like?
- 9) Respond to each of the following statements.
- “Since money is neutral, there is no point at all in trying to use monetary policy to affect output.”
 - “Since fiscal policy cannot change the natural level of output, we can say that government spending, too, is neutral.”
 - “Lower interest rates can be achieved by a more expansionary monetary policy or by larger private savings (and/or lower budget deficits). So, for policy makers it is a matter of taste to choose among these alternatives.”
- 10) Consider the following numerical version of the IS-LM model:
- $$C = 400 + 0.5Y_D; \quad I = 700 - 4,000i + 0.1Y; \quad G = 200; \quad T = 200; \quad (M/P)^d = 0.5Y - 7,500i; \quad (M/P)^s = 500$$
- Derive the equation of the AD curve for this model.
 - Suppose that government spending increases by 500. What are the effects on Y , i , C and I ?
 - Set all variables back to their initial values. Now, suppose that the money supply increases by 500. What are the effects on Y , i , C and I ?

Makroökonomie: Aufgabenblatt 8

(The Phillips Curve, Inflation, Unemployment, Interest Rates and Exchange Rates – Blanchard, Kapitel 17, 18 und 19)

1. The Phillips curve is: $\pi_t - \pi_t^e = 0.18 - 3u_t$, where $\pi_t^e = \theta\pi_{t-1}$. In period t-1 the unemployment rate is equal to the natural rate, and the inflation rate is zero percent.
- What is the natural rate of unemployment?
 - Suppose that beginning in period t, the authorities bring the unemployment rate down to 5 % and keep it there indefinitely. What is the inflation rate in periods t, t+1, t+2 and t+3 when $\theta = 0$ and $\theta = 1$. Compare.
 - For which values of θ does $u_t < u_n$ (u_n natural unemployment rate) imply an acceleration of the price level (i.e. increasing rate of inflation)? Explain!

2. (Same Phillips curve as in 1. and $\theta = 1$). In period t-1, unemployment is at its natural rate, and the inflation rate is zero. In period t two things happen: (1) The authorities move the actual unemployment rate to 5% and keep it there. (2) Half of all workers sign indexed labor contracts.
- Give the new equation for the Phillips curve. Explain.
 - Calculate the inflation rates in period t, t+1 and t+2.
 - What does indexing imply about the impact of maintaining the unemployment rate below the natural rate?

3. Suppose the economy can be described by the following three equations:

$$u_t - u_{t-1} = -0.4(g_{yt} - 0.03) \quad (\text{Okun's Law})$$

$$\pi_t - \pi_{t-1} = -(u_t - 0.06) \quad (\text{Phillips curve})$$

$$g_{yt} = g_{mt} - \pi_t \quad (\text{Aggregate Demand Relation, AD})$$

- Suppose that inflation is running at 10% each year and the economy is operating at the natural rate of unemployment. To keep unemployment at its natural rate, what must be (1) the growth rate of output? (2) the growth rate of the money supply?
- Now, in t, the authorities use monetary policy to reduce inflation to 5% and keep it there. What will happen to the unemployment rate and output growth in t, t+1 and t+2? What money growth rate will accomplish this goal?

4. (Model as in 3.)

- Reduce the three equations to two by substituting the AD relation into Okun's law.
- Initially: $u_t = u_{t-1} = 0.06$, $g_{mt} = 0.1$, and $\pi_t = 0.07$. Now, this year money growth is permanently reduced from 10% to 0%. (1) Determine the impact on unemployment and inflation this year and next year. (2) Determine the long-run impact on unemployment and inflation.

5. Was spricht für und was dagegen: sofortige versus graduelle Reduktion der Inflationsrate?

6. What is the Fisher hypothesis?

7. Suppose that starting from an initial equilibrium at the natural level of output, a country revalues its currency.

- What is the short-run impact of this policy (AD-AS diagram)?
- In the short-run, what happens to the real exchange rate, net exports, and output?
- Where is the long-run equilibrium in the diagram?
- In the long-run, what happens to the real exchange rate, net exports, and output?

8. Which policy bundle would achieve a reduction in the trade deficit without changing output? (Show it in the AD-AS diagram).

Makroökonomie: Aufgabenblatt 9

(The Long Run - Growth, Capital Accumulation, and Technological Progress

Blanchard, Kapitel 22, 23 und 24)

- 1*. Assume that typical consumers in Mexico and the United States buy the quantities and pay the prices indicated in the table below:
- Calculate U.S. consumption per capita in dollars.
 - Calculate Mexican consumption per capita in pesos.
 - Suppose that the exchange rate is 0.1 (\$0.10 per peso). Using the current exchange rate, calculate Mexico's consumption per capita in dollars.
 - Using the purchasing power parity method and U.S. prices, calculate Mexico's consumption per capita in dollars.
 - Under each method, how much smaller is the standard of living in Mexico than in the United States? Does the choice of method make a difference?

		FOOD		CONSUMER DURABLES	
	Price	Quantity		Price	Quantity
Mexico	1 peso	1,000		10 pesos	500
United States	\$1	2,000		\$2	4,000

- Consider the production function $Y = \sqrt{K}\sqrt{N}$.
 - Calculate output when $K = 64$ and $N = 100$.
 - If both capital and labor double, what happens to output?
 - Is this production function characterized by constant returns to scale? Explain.
 - Write this production function as a relationship between output per worker and capital per worker. (Hint.- Divide both sides of the production function by N .)
 - As capital per worker increases from 2 to 4 to 6, what happens to output per worker?
 - Will this production function have the same general shape as the one in Figure 22-5? Explain.
- As discussed in chapter 22, sustained growth in output per worker requires sustained technological progress. Table 22-1 seems to contradict this: From 1950 to 1973, Japan had higher growth than the United States, yet there were many more important technological discoveries in the United States than in Japan. Can you resolve this apparent contradiction?
- "An increase in saving per worker implies an increase in capital per worker, an increase in output per worker, and therefore a higher growth rate of output per worker." Discuss.
- Suppose that the government, which was running a balanced budget, now decides to increase spending without increasing taxes and thus to run a budget deficit equal to 2% of GDP forever. Assume that the private saving rate does not change.
 - On a diagram similar to Figure 23-2, show the impact of the rise in the budget deficit.
 - How will the new steady state be different from the old one? In what way will it be similar to the old one?
 - Does the change in the budget deficit affect the economy's growth rate? Explain carefully.
- Discuss the likely impact of the following changes on the level of output per worker in the long run:
 - A decrease in the retirement age.

- b. A new discovery that prolongs the life of capital equipment.
7. Suppose the production function in an economy is given by $Y = \sqrt{K}\sqrt{N}$, and both the saving rate (s) and the depreciation rate (δ) are equal to 0.1.
- What is the steady-state level of capital per worker?
 - What is the steady-state level of output per worker?
 - Suppose that output and capital per worker have reached their steady states in period t , and then, in period $t + 1$, the depreciation rate increases to 0.20.
 - What will be the new steady-state levels of capital per worker and output per worker?
 - Calculate the path of capital per worker and output per worker over the first three periods after the change in the depreciation rate.
8. How would each of the following policy changes affect (1) the appropriability, (2) the fertility, and (3) the amount of R&D spending?
- Increasing patent protection from 17 to 25 years
 - Allowing corporations a full credit against taxes for their R&D spending, rather than just a deduction from revenue
 - Government-sponsored conferences between university scientists and corporate managers to discuss the latest discoveries
9. Why is it more "pessimistic" to attribute the recent decline in growth in the richer countries to a decline in the rate of technological progress rather than to a decline in the saving rate?
10. Suppose the economy's production function is $Y = \sqrt{K}\sqrt{NA}$ and both the saving rate (s) and the depreciation rate (δ) are equal to 0.10. Further, suppose that the number of workers grows at 1.5% per year ($g_N = 0.015$) and the rate of technological progress is 3.5% per year ($g_A = 0.035$).
- Find the steady-state values of:
 - the capital stock per effective worker.
 - output per effective worker.
 - the growth rate of output per effective worker.
 - the growth rate of output per worker.
 - Suppose that the rate of technological progress increases to 7% per year. Recalculate the answers to (i) through (iv) in a. above.
 - Now suppose that the rate of technological progress is 7% per year, and the number of workers grows at 3% per year. Recalculate the answers to (i) through (iv) above.
11. Use your answers in b. and c. in question 10 above to evaluate each of the following statements:
- "In steady state, the capital stock per effective worker is independent of the rate of technological progress. "
 - "In steady state, the level of output per effective worker is independent of the rate of technological progress. "
 - "In steady state, growth in the standard of living depends on the rate of technological progress."
 - "In steady state, growth in the standard of living depends on how fast the population is growing."