

## Handout 6

**diese Woche:** 5. Allgemeine Gleichgewichtstheorie / General Equilibrium (all markets)

5.1. Tauschwirtschaft

Edgeworthbox, Marktgleichgewicht, mutually beneficial Trades, Contract Curve, Effizienz auf der Konsumentenseite, Erstes Wohlfahrtstheorem, Walras' Law

5.2. Produktion und Konsum

der schizophrene Robinson Crusoe, Pareto-Effizienz, Walras' Law, Zweites Wohlfahrtstheorem.

**zu lesen:** Intermediate Varian Kap. 29 + 30 sowie Jehle & Reny Kap. 5.

### Übungsaufgaben:

- 1 Consider a 2-person exchange economy. Agents A and B both have identical preferences which can be represented by  $U(x_1, x_2) = x_1 x_2$ . Person A is endowed with 2 units of  $x_1$  and 8 units of  $x_2$  while person B is endowed with 8 units of  $x_1$  and 2 units of  $x_2$ .
  - a) Draw the corresponding Edgeworth box and depict the endowment point, the set of mutually preferred points, and the contract curve.
  - b) derive the utility maximizing demand functions for both agents.
  - c) Find the equilibrium price ratio  $p_1/p_2$ . Can you also find the exact absolute equilibrium prices  $p_1$  and  $p_2$  - why or why not?
2. Again consider a 2 person exchange economy. Suppose person A has preferences à la  $U = x + 2y$  and person B's preferences can be represented by  $U = 2x + y$ . Depict the contract curve. Choose an endowment point in the interior. Depict the mutually beneficial trades. What will be the outcome of the market mechanism - is it unique or are there several possible outcomes? What about MRSs and relative price at this point/these points?
3. Instead of spending the summer in Kiel, you have chosen a remote, deserted island in the South Pacific. You can use your time to collect coconuts or recover from a hard year at CAU. If you work you end up with coconuts according to a concave production function. In a time-coconut diagram, depict this production function and your preferences. What is your optimal point? Now suppose the intense sunshine, the loneliness, and that ... micro class you took during your year at CAU render you schizophrenic. One part of you plays price-taking consumer, the other price-taking producer. Visualize each parts' optimum as a function of relative price (real wage). Can you think of the above optimal point as a market equilibrium?
4. Explain the rationale behind Walras' law and derive it mathematically for an exchange economy.
5. Alone and far from his gold on a remote island, Dagobert Duck has become schizophrenic. On the one hand, Dagobert offers labor for sale and buys sanddollars with the wage (+ possibly profits).  $U(x, l) = \ln(x) + \ln(24-l)$  describes his utility, where  $l$  is labor in hours and  $x$  the number of sanddollars. On the other hand, the entrepreneur Mr. Duck produces sanddollars from labor according to the production function  $y = l$ . It goes without saying that Mr. Duck maximizes profits. Furthermore, assume that both halves of his personality take relative price (real wage) as given.
  - a) For consumer Dagobert as well as CEO Mr. Duck, depict their individual optimization problem graphically and derive their supply and demand functions.
  - b) Show that a relative price of one and the corresponding quantities are a market equilibrium. Could a healthy (ie not schizophrenic) Dagobert Duck do any better?