Hand-out week 3

This week: 1.4. Dual Approach

expenditure minimization

Hicksian/compensated demands

expenditure function

Shephard's Lemma

Slutsky Equation

Restrictions and Empirical testing

Readings: Varian chapter 8 **and** DM 2.3

Practice Problems:

1. Show that expenditure minimization leads to the same optimality condition (MRS = rel. price) as utility maximization. Try to understand both concepts/procedures graphically.

2. Take our standard Cobb-Douglas utility function, $U(x_1, x_2) = x_1^\alpha x_2^\beta$ where the exponents sum to one, and derive the compensated (= Hicksian) demand functions and the expenditure function. What does the latter tell you / what is its interpretation?

3. Do you discover any connections between expenditure and indirect utility function and between Hicksian and the original (Marshallian) demand functions. Look at the actual functions we have derived for the Cobb-Douglas case.

4. Use Shephard's lemma to calculate the Hicksian demands from the expenditure function. Check that they are the same as above.

5. Find the derivatives of these compensated demand functions with respect to the price of the other commodity. Why do they have to be the same? How does this help us find a consistent definition of substitutes and complements?

6. Consider the Slutzky equation (wrt the own price). Sign each term for a normal good, a Giffen good, and an inferior good which is not a Giffen good.