Cobb Douglas EV, CV Example

Suppose that the utility function is $u(x, y) = xy$ with initial wealth $W^0 = 60$ and initial prices $p^0 = 2$, $q^0 = 2$ at time 0.

(a) Compute EV without using the Hicksian demand function for a price increase on good 1 at time 1 to $p^1 = 3$. Assume that price q and wealth w do not change from time 0 to time 1 so that $W^1 = 60$ and $q^1 = 2$.

(b) Compute CV without using the Hicksian demand function for the same price increase studied in part (a).

(c) Now use Hicksian demand to compute EV.

(d) Now use Hicksian demand to compute CV.

(e) Now compute the Area Variation associated with the change in price.

(f) Now use a linear approximation to the Hicksian to produce a linear approximation to EV and CV – appropriate for a case where we can estimate the Walrasian demand function, but cannot estimate the Hicksian demand function.

(2006 Midterm) 3. [20 points] Based on empirical analysis, you have the following information about a typical poor consumer's demand for heating oil:

Own price elasticity of demand:	-2
Wealth elasticity of demand:	1
Current price:	10
Current consumption:	120
Current wealth:	1200

For the coming heating season, the government is expecting an increase in the price of heating oil to 12. It is interested in determining how much to increase public assistance so that the poor people can maintain their current standard of living after the increase in the price of heating oil.

(3a) According to economic theory, how should the government determine the required increase in public assistance? Briefly explain your answer. Be sure to relate it to the concepts studied in class.

(3b) Using the data provided above, estimate how much public assistance should be increased in order to maintain the poor consumers' standard of living.

(3c) [added by Sam for section…not on the original midterm] Now assume that the price increase was due to a tax. Calculate the deadweight loss of the tax using the concept from part b.

(2005 Midterm)

4. [20 points] The Massachusetts State Lottery Commission wants to determine the Bernoulli utility function of its customers. Assume the customers have an initial wealth of zero (i.e. their debts equal their assets), and that they are known to be Expected Utility Maximizers. Moreover the Commission is certain that they all have the same Bernoulli utility function $u(x) = cx^{\alpha}$, where c and α are positive, but the Commission does not know the value of the parameters c and α.

In order to learn the Bernoulli utility function, and thereby to make predictions about behavior, the Commission distributes two types of lottery tickets, without cost to the customer, to a sample of people in the population. It is determined that everyone is indifferent between these two lotteries, which are:

(i) a lottery that gives them a \$1,000,000 prize with a chance of one-in-a-million,

and

(ii) a lottery that gives them two possible prizes, \$1000 with probability of one-in-twenty-thousand and \$1,000,000 with probability one-in-two-million.

4a) Does this information determine the value of α and c? Explain.

4b) What is the value of α?

4c) Suppose the Commission decides to do away with million dollar prizes. How much of a chance does it have to offer on the \$1000 prize so that people who have been given the original lottery tickets described above will be willing to exchange them for a ticket that offers only a \$1000 prize.

(2004 Midterm)

1. [30 points] Consider a two-commodity world and consumer with the following utility function:

$$u(x_1, x_2) = \left(x_1^{1/2} + x_2^{1/2}\right)^2$$

The prices of goods 1 and 2 are p_1 and p_2, respectively, and the consumer has initial wealth w.

a) State the consumer's utility maximization problem [3 points]
b) Will this consumer's Walrasian demand functions satisfy Walras' Law? Explain your answer? [3 points]
c) Derive the consumer's Walrasian demand functions and indirect utility functions. [12 points]
d) Suppose that the consumer has wealth w = 260. Initially, prices are (p_1,p_2) = (6,8). Suppose prices change to (p'_1,p'_2) = (5,12). What is the (exact) equivalent variation of this price change? [12 points]