MICROECONOMICS 1 **17/11/2011**
CLASS #7

ELASTICITY

Problem #1
In reality, if we have data on sales and prices we are able to approximate the demand function. Although this technique (econometrics) will become familiar to you only two years from now, using simplified approximations we can attempt at doing the same. In Table 1 below you can find data for fairly similar shops selling the same product (coke cans).

Table 1

Price	Number of cans sold
3	261
2.8	287
2.6	320
2.4	351
2.2	381
2	408
1.8	440
1.6	473
1.4	502

a) Based on these data one can come up with some estimates of the demand function (e.g. calculate price elasticity). Fill in the tables below (in Table 2A assume a decrease in prices and in Table 2B – an increase thereof).

Table 2A (prices decrease)

Price	Elasticity
3	.
2.8	-1.49
2.6	
2.4	
2.2	-1.03
2	-0.78
1.8	-0.78
1.6	-0.68
1.4	-0.49

Table 2B (prices increase)

Price	Elasticity
3	-1.26829
2.8	-1.34063
2.6	-1.05983
2.4	-0.86614
2.2	-0.66176
2	
1.8	
1.6	-0.40438
1.4	.

b) Why do elasticity values differ so much in both tables? If we take a look at the point elasticity formula, we can notice that measurement depends on the direction of the change (measurement error – the smaller the changes in price and quantity, the less important it is). It is possible to avoid this by applying a different formula – for the so-called arc elasticity.
Find the arc elasticity for price level 2.6 and fill in Table 3.

Table 3 (prices decrease and increase)

Price	Arc elasticity
3	.
2.8	-1.37591
2.6	
2.4	-1.15499
2.2	-0.94262
2	-0.71863
1.8	-0.71698
1.6	-0.61446
1.4	.

c) Another way to look for elasticity is to calculate it directly from the demand function formula. We can approximate this function by a line giving an estimate of the price-quantity relation. Do it on the basis of the instructions given below.
Step 1: Make a graph and indicate price-quantity points on it.
Step 2: Draw the line approximating the demand function.
Step 3: Determine the points where the demand function intersects axes and on the basis of this find the formula for the function.
Calculate the price elasticity directly from the demand function formula. Determine this elasticity for the price equal 2.

Problem #2

Find the elasticity of the demand function for price equal 20 *zloty* for the following situations:

a) The demand function is given by the formula: $x = 120 - 2p$.

b) The inverse demand function is given by the formula: $p = 100 - x/2$.

c) The demand function is given by the formula: $x = -3p^{-2}$.

d) Elasticity of demand equals -2.3 when calculated in *zloty* but for international comparisons it is necessary to provide its value in euro. The exchange rate *zloty*/euro is 4 *zloty* per 1 euro.

Problem #3

An economic analyst in a large company has the following information concerning demand for chocolate waffles:

income elasticity of demand	0.7
price elasticity of demand	-0.7
close substitutes	sweets
mixed (cross-) elasticity	?

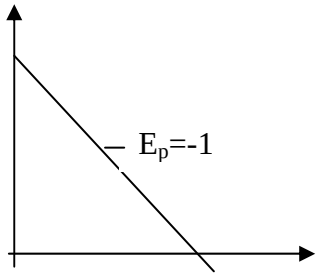
a) Provide the definitions:

income elasticity of demand = 0.7	
price elasticity of demand = = -0.7	
Inferior goods (example)	
Mixed (cross-) elasticity of chocolate waffles *versus* sweets	

b) Demand for chocolate waffles is..... i.e. increase in their price will cause a more/less than proportional …… in demand.

c) Chocolate waffles are a..... good, i.e. decrease in income will cause ..... in demand.

d) To maximize the revenue from selling chocolate waffles one should …….. the price of waffles.



e) Consumer incomes are about to fall by 15% in the nearest future. This means that the demand for chocolate waffles will..... by .....%.

f) The price of chocolate waffles is about to increase by 7.5%, which implies that the demand will …… by …….%.

g) The 3% increase in the price of sweets caused a 2% increase in the demand for chocolates. This implies that the mixed (cross-) elasticity has the value of ……..

h) In the nearest future the price of sweets is about to increase by 1.5%. That implies that the demand for chocolate waffles will ……. by ……%.