ΠΜΣ «Οικονομική Επιστήμη»
ΕΚΠΑ
Τμήμα Οικονομικών Επιστημών
Microeconomic Theory – Consumer Theory October 2018
Instructor: Georgia Kaplanolgou

Problem Set 1

1. Show that if $f : R \to R$ is a strictly increasing function and $u : X \to R$ is a utility function representing preference relation $\succeq$, then the function $v : X \to R$ defined as $v(x) = f(u(x))$ is also a utility function representing preference relation $\succeq$.

2. Prove that if $\succeq$ is rational and $x \succ y \succeq z$, then $x \succ z$.

3. Let $X = \{x, y, z\}$ and consider the choice structure (β, $C(.)$) with

$$\beta = (\{x,y\}, \{y, z\}, \{x, z\}, \{x,y,z\})$$

And $C(\{x,y\}) = \{x\}$, $C(\{y,z\}) = \{y\}$, $C(\{x,z\}) = \{z\}$, show that (β, $C(.)$) violates the WARP.

4. If the WARP holds for the Walrasian demand function x(p,w) then demand should be homogeneous of degree 0 in prices.

5. Assume a consumer having positive wealth w in an economy with two goods only, with prices $p_1 > 0$ and $p_2 > 0$.
a) Draw the budget set $B_{\underline{p},w}$ and choose a point for consumption $\underline{x}$ that satisfies Walras' Law and the requirements $x_1 > 0$ and $x_2 > 0$. What is the slope of the budget line?
b) Suppose that the prices change from $\underline{p}$ to $\underline{p}'$, $p_1 = p_1'$ and $p_2' > p_2$, and that the new budget line passes through $\underline{x}$. Draw $B_{\underline{p}',w'}$ and the new budget set on the same figure you made for (a). What is the new level of wealth w'? Show Δw on your figure.
c) Indicate (on the figure you have drawn) all the points for consumption under prices $\underline{p}'$ and wealth w' that agree with the WARP (they do not necessarily have to satisfy Walras' law).

6. In an economy with two goods, suppose that in period 1 there is equal demand for both goods (i.e. $x_1(p_1, p_2, w) = x_2(p_1, p_2, w)$). Then, in period 2, the price of good 1 increases from p_1 to p_1', while the price of good 2 decreases from p_2 to p_2'.
a) If the Slutsky wealth compensation for this change in prices is zero, find the relation between Δp_1 and Δp_2. Then show on a diagram the locations of demand for period 2 that do not violate the weak axiom of revealed preference.
b) Suppose that in period 3 there is no change in wealth, the price of good 1 further increases to p_1'', while the price of good 2 remains unchanged (equal to p_2'). Use the diagram you made for (a) to show that any demand in period 3 is consistent with the weak axiom of revealed preference.

7. You are given the following partial information about a consumer's purchases. He consumes only two goods.

	Year 1		Year 2	
	Quantity	Price	Quantity	Price
Good 1	100	100	120	100
Good 2	100	100	?	80

a) Over what range of quantities for good 2 consumed in year 2 would you conclude that his behaviour is inconsistent (i.e. it violates the WARP)?
b) Over what range of quantities for good 2 consumed in year 2 would you conclude that the consumer's consumption bundle in year 1 is revealed preferred to that in year 2?
c) Over what range of quantities for good 2 consumed in year 2 would you conclude that the consumer's consumption bundle in year 2 is revealed preferred to that in year 1?

8. You observe a consumer in two situations: with an income of $100 he buys 5 units of good 1 at a price of $10 per unit and 10 units of good 2 at a price of $5 per unit. With an income of $175 he buys 3 units of good 1 at a price of $15 per unit and 13 units of good 2 at a price of $10 per unit. Do the actions of this consumer conform to the basic axioms of consumer behaviour?

9. Consider a setting where $L=3$ and a consumer whose consumption set is R^3. Suppose that his demand function $x(p,w)$ is $x_1(p,w)=p_2/p_3$, $x_2(p,w)=-p_1/p_3$ and $x_3(p,w)=w/p_3$.
(a) Show that $x(p,w)$ is homogeneous of degree zero in (p,w) and satisfies Walras' law.
(b) Show that $x(p,w)$ violates the weak axiom.