Quiz #1 - EconS 527

August 29th, 2018

Question #1 (40 Points)

Discuss whether the following function is monotone or strongly monotone and if it satisfies convexity or/and strict convexity

$$u(x_1, x_2) = \min(\alpha x_1, \beta x_2)$$

Solution

Monotone since

$$\min(\alpha x_1 + \delta, \beta x_2 + \delta) > \min(\alpha x_1, \beta x_2)$$

for all $\delta > 0$

But it is not strongly monotone since

$$\min(\alpha x_1 + \delta, \beta x_2) \not> \min(\alpha x_1, \beta x_2)$$

if $x_2 < x_1$. In addition $u(x_1, x_2)$ satisfies convexity but not strict convexity.

Question #2 (30 Points)

Define *strict quasiconcavity* and check if the utility function $u(x_1, x_2) = x_1 + x_2$ satisfies strict quasiconcavity. Use a graph to support your answer.

Solution

Definition: A utility function satisfies strict quasiconcavity if, for every two bundles, the utility of consuming its convex combination, $u(\alpha x + (1-\alpha)y)$, where $0 < \alpha < 1$, is strictly higher than the minimal utility from consuming each bundle separately, $min\{u(x), u(y)\}$

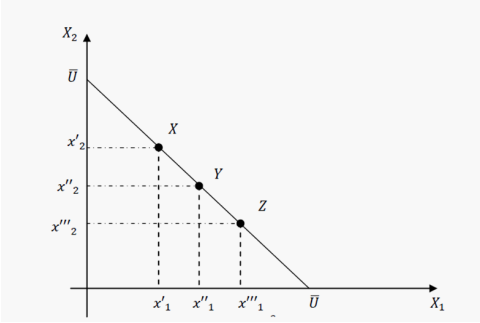

Figure 1

Using figure 1 it is easy to show that $u(x_1, x_2)$ satisfies quasiconcavity since $u(\alpha x + (1-\alpha)y) = \min\{u(y), u(y)\} = \overline{u}$. However, it does not satisfy strict quasiconcavity given that the convex combination is not trictly higher than the minimal utility.

Question #3 (30 Points)

Identify and discuss three sources of intransitivity.

Solution

1. Indistinguishable alternatives
2. Framing Effects
3. Aggregation of Criteria
4. Change in preferences