Kanheman and Tversky (1979)

- Choose one of the following lotteries:

A: 80% chance of winning U$4000

B: 100% chance of winning U$3000

- Choose one of the following lotteries:

C: 20% chance of winning U$4000

D: 25% chance of winning U$3000

Cont´d

- Most people : B>A and C>D
- From a rational point of view is a contradiction:
- By expected utility B>A means:

$$0,8u(x+4000)+0,2u(x)<u(x+3000)$$

Then

$$0,2u(x+4000)+0,05u(x)<0,25u(x+3000)$$

Adding $0,75u(x)$ both sides:

$$0,2u(x+4000)+0,8u(x)<0,25u(x+3000)+0,75u(x)$$

That is D>C

Allais' Paradox

- In 1953 after the axiomatization of the expected utility theory the french economist Maurice Allais suggest the following experiment:

Choose between A and B:

A: U$1m with certainty

B:U$1m with probability 0.89

U$5m with probability 0.10

U$0 with probability 0.01

Allais' Paradox

Now choose between:
C: $1000000 with probability 0.11
$0 with probability 0.89
D: $5000000 with probability 0.10
$0 with probability 0.90

- Most people A>B and D>C
- Substract *u(1m)* with 0.89 of chances of A and B, and add *u(0)* with chances of 0.89 We obtain a contradiction.

Allais' Paradox

- Using Prospect Theory, we can explain *qualitatively*, why we prefer A to D.

- But it is not possible to solve *quantitatively* Allais' Paradox.

Ellsberg's Paradox

- In 1962, Daniel Ellsberg, obtained his Ph. D with a Thesis exploring the following experiment:
- There is an urn with 90 balls, 30 red and the other 60 are black or yellow, one ball will be picked from the urn, you must choose between the following lotteries:

Ellsberg's Paradox

A: $100 if ball is red

B: $100 if ball is black

And between:

C: $100 if the ball is red or yellow

D: $100 if ball is black or yellow

Ellsberg's Paradox

- Most people prefer A and D, it is a contradiction with EUT.
- And is inconsistent with Prospect theory.
- Daniel Ellsberg argues that people deal with uncertainty (situations with unknown probabilities) differently in comparison with risk (situations with known probabilities)