1. Why are employees typically paid a **fixed** salary and not a salary that varies with the firm's profits?

2. Why are some employees (e.g. managers of a firm) typically paid a **variable** salary, that is, a salary that varies with the firm's profits?

3. Why do some markets violate the “Law of Supply and Demand”?

4. Why do insurance companies typically offer a choice of different insurance contracts (the lower the premium the higher the deductible)?

5. Could education be a waste of resources?

UNCERTAINTY

Example. Ann is currently working for a bank and her annual income is $36,000. She is considering quitting her job and starting her own business as an interior designer, but has no idea what kind of income she will be able to make. To quantify her uncertainty she does a Google search to find out how much interior designers typically earn. Suppose that she finds the following information:

reported income	$10,000	$25,000	$40,000	$65,000
percentage	10%	40%	30%	20%

Her choice is:

$$L = \begin{pmatrix} \$x_1 & \$x_2 & \dots & \$x_n \\ p_1 & p_2 & \dots & p_n \end{pmatrix}$$

the **expected value of L,** denoted by $\mathbb{E}[L]$, is the number

$$\mathbb{E}[L] =$$

Expected value of $\begin{pmatrix} \$10{,}000 & \$25{,}000 & \$40{,}000 & \$65{,}000 \\ \frac{1}{10} & \frac{4}{10} & \frac{3}{10} & \frac{2}{10} \end{pmatrix}$ is

Notation: given two money lotteries L and M, we write

$L \succ M$ means

$L \sim M$ means

$M \succ L$ means

Given a money lottery L, imagine giving the individual the choice between L and the expected value of L for sure, that is, the choice:

If she says that

- $\mathbb{E}[L] \succ L$

- $\mathbb{E}[L] \sim L$

- $L \succ \mathbb{E}[L]$

In our example, Ann has a choice between

- staying at her current job: $\begin{pmatrix} \$36,000 \\ 1 \end{pmatrix}$ or

- starting her own business: $L = \begin{array}{cccc} \$10,000 & \$25,000 & \$40,000 & \$65,000 \\ \frac{1}{10} & \frac{4}{10} & \frac{3}{10} & \frac{2}{10} \end{array}$

Since $\mathbb{E}[L] = 36,000$,

- If Ann prefers keeping her current job she is risk

- If Ann prefers starting her own business she is risk

- If she is indifferent between the two options she is risk

Note: that the same person can be risk averse relative to a lottery L and risk loving relative to another lottery M. For example, people who buy home insurance are risk averse relative to the corresponding lottery (as we will see), but if they the buy a lottery ticket for the Powerball then they are risk loving relative to that lottery.

Given a money lottery *L,* its **certainty equivalent**, for a particular individual, denoted by C_L, is that sum of money such that

Assuming that the individual in question prefers more money to less,

- if she is **risk averse relative to *L***
- if she is **risk neutral relative to *L***
- if she is **risk loving relative to *L***

Given a money lottery L, its **risk premium**, for a particular individual, denoted by R_L, is that sum of money such that

Assuming that the individual in question prefers more money to less,

- if she is **risk averse relative to *L***
- if she is **risk neutral relative to *L***
- if she is **risk loving relative to *L***

The relationship between $\mathbb{E}[L]$, C_L and R_L:

Note that if an individual

(1) prefers more money to less,

(2) is risk neutral relative to every money lottery,

(3) has transitive preferences,

then he ranks money lotteries according to their expected values, that is