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

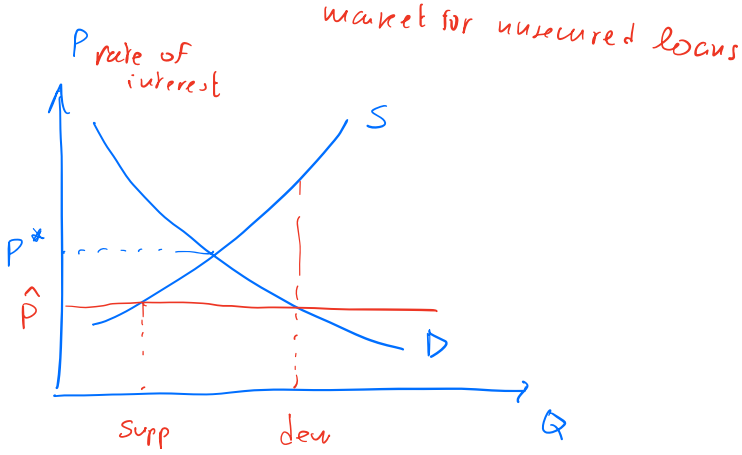
Optimal risk sharing

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?

Theory of incentives

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

Asymmetric information
adverse selection



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

adverse selection
moral hazard
} asymmetric information

5. Could education be a waste of resources?

Signaling

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:

quit current job $\quad L = \begin{pmatrix} \$10k & \$25k & \$40k & \$65k \\ \frac{1}{10} & \frac{4}{10} & \frac{3}{10} & \frac{2}{10} \end{pmatrix}$ money lottery

stay at her current job $\quad M = \begin{pmatrix} \$36k \\ 1 \end{pmatrix}$

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

money lottery

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

$\mathbb{E}[L] =$ $x_1 \cdot p_1 + x_2 \cdot p_2 + \dots + x_n p_n$

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

$\frac{1}{10}\,10{,}000 + \frac{4}{10}\,25{,}000 + \frac{3}{10}\,40{,}000 + \frac{2}{10}\,65{,}000 = 36{,}000$

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

$L \succ M$ means L is considered to be better than M (M is preferred to L)

$L \sim M$ means L is just as good as M

$M \succ L$ means M is preferred to L

$L = \begin{pmatrix} \$0 & \$100 \\ \frac{1}{2} & \frac{1}{2} \end{pmatrix}$

$E[L] = 0 \cdot \frac{1}{2} + 100 \cdot \frac{1}{2} = 50$

$\begin{pmatrix} \$50 \\ 1 \end{pmatrix}$ vs L

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:

How do you compare $\begin{pmatrix} E[L] \\ 1 \end{pmatrix}$ and L

If she says that

- $\mathbb{E}[L] \succ L$ then classify as risk averse
- $\mathbb{E}[L] \sim L$ " risk neutral
- $L \succ \mathbb{E}[L]$ " risk loving

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: $L = \begin{matrix} \$10,000 & \$25,000 & \$40,000 & \$65,000 \\ \frac{1}{10} & \frac{4}{10} & \frac{3}{10} & \frac{2}{10} \end{matrix}$

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

- If Ann prefers keeping her current job she is risk AVERSE
- If Ann prefers starting her own business she is risk LOVING
- If she is indifferent between the two options she is risk NEUTRAL

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.