1 Book Notes

Sunday, January 10, 2021 8:09 PM

Aim

Apply microeconomic tools "systematically to problems faced by firms and their managers"

"Applied microeconomic analysis underpins much of the information upon which business students will base professional decisions"

Must use good sources well

The Goal of the firm (and its Management)

Firms procure inputs and produce outputs

$\pi = R - C$
- C → cost
- R → revenue
- π → profit

Who claims profit (residual revenue)?
- → The firms shareholders are the **residual claimants**

Σ(all shares) = **expected present value** of all future profits

Shareholders want money and will seek to provide their **agents** (firm management) with incentives to maximize share value

Present Value

$FV = PV(1+r)^t$
- t = time periods
- r = interest rate
- PV = present value
- FV = future value

$PV = FV/(1+r)^t$ → **discounts** FV backward

Example:
$r = 10\%$ $PV = \$1$ $t = 3$ $FV = ?$
$FV = PV(1+r)^t$
$FV = 1(1+.1)^3$
$FV = 1(1.1)^3$
$FV = 1.331$

$r = 10\%$ $FV = 3$ $t = 2$ $PV = ?$
$PV = FV/(1+r)^t$
$= 3/(1+.1)^2$
$= 2.48$

π_t = Value of π after period t

$\Sigma_t = \pi_t/(1+r)^t$

Example:
$\pi_0 = -124$ $\pi_1 = 21$ $\pi_2 = 72$ $\pi_3 = 45$ $r = 8\%$ $NPV = ?$
- → $NPV = -124 + \frac{21}{1.08} + 72/1.08^2 + 45/1.08^3 = -7.10$

Information Structure

Who knows what

3 types:

Complete and perfect information
Everyone knows everything

Simple risk and uncertainty

Risk: everyone shares estimates of probabilities of each outcome
Uncertainty: When there is not enough information to determine the amount of risk
Subjective probability: estimate risk based on personal knowledge

Asymmetric Information

People have different amounts of information

This can lead to two forms of market failure...

Adverse Selection: When someone has information about inherent market characteristics that others don't have

Moral hazard: Someone has information about an action they're taken that others can't do and are therefore shielded from consequences

Expected Value and attitudes towards risk

Expected Value (EV)
Certainty equivalent (CE)

EV = average outcome over many iterations

i = outcome index
x_i = value of outcome i
f_i = probability of i

Expected Value of x $E(x) = \Sigma_i f_i x_i$

$Pr(x_i)$ = Probability that x takes on the specific value of x_i

Example:
$i_1 = .8$ $x_{i_1} = 40$ $i_2 = .2$ $x_{i_2} = -100$

$Pr(\pi = 40) = .8$ and $Pr(\pi = -100) = .2$
$E(x) = \sum_{i=1}^{n} Pr(x_i)\, x_i = .8 \cdot 40 + .2 \cdot -100 = 12$

CE of a lottery is the sum of money for certain that is viewed as exactly equivalent to the lottery

Risk neutral
Risk averse
Risk neutral

Expected Present Value and the Value of the firm

Assume firms are risk neutral

Diversify stocks to balance out risk

Expected Present Value (EPV)

$EPV = \Sigma_t [\Sigma_i f_{it} X_{it}]/(1+r)^t$

Example:
Year one: .4 for 100, -200
Year two: .7 for 400, -200
$r = 7\%$

$PEV = [.4 \cdot 100 + .6 \cdot -200]/1.07 + (.7 \cdot 400 + .3 \cdot -200)/1.07^2$
$PEV = -74.76 + 192.15 = 117.39$

Value of Information - Part 1 - yes/no decisions

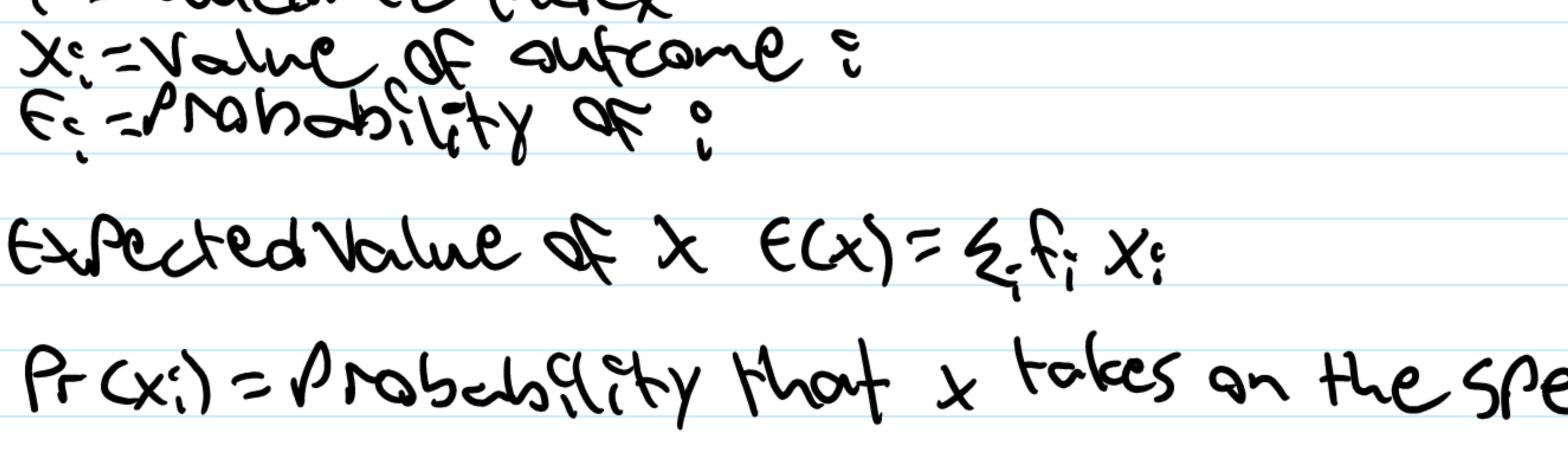
Value of better information vs perfect information

S = Success f = Failure π = Payoff

Decision trees...

Example:
$Pr(S) = .5$ $\pi_S = 100$ $\pi_f = -60$ $\pi = ?$

$E(\pi \mid \text{No Info}) = \max((Pr(S)\pi_S + Pr(f)\pi_f), 0)$
$E(\pi \mid \text{No Info}) = \max(.5(100) + .5(-60), 0)$
$E(\pi \mid \text{No Info}) = \max(20, 0) = 20$



Significant chance of failure

What's to come

More math!

Marginal revenue and marginal cost
- → at maximum π, $MR = MC$

Perfectly competitive markets

Uses and limits of models

Models don't tell the whole story