Recall: If capitalist has control rights, we might have inefficiency.
- What can we do next?

Suppose
- E has control with prob π and C has control w/ prob $1-\pi$ such that
- $\pi \underbrace{y(a_E)}_{\text{cash flows}} + (1-\pi) \cdot y(a_C) = K$

after contract is signed but before a is chosen, introduce a verifiable state θ is realized
- $y(a,\theta) = \alpha(\theta) z(a) + \beta(\theta)$ w/ $\alpha > 0, \alpha' < 0, z > 0$
- This implies $\left|\frac{\partial y}{\partial a}\right| = \alpha(\theta) |z'(a)|$ is $\downarrow$ in θ
  - y is less sensitive to a when θ is high

Result: optimal contract has a cutoff θ^* such that $\theta > \theta^* \Rightarrow$ E has control
$\theta \leq \theta^* \Rightarrow$ C has control
- Looks like a debt contract!
- This reduces the amount of time that the capitalist is inefficiently in control.

Costly state verification approach
Townsend '79, Gale/Hellwig '85

Idea: Debt is less "informationally sensitive" than equity.

- 2 players $\{\underbrace{E}_{\text{entrepreneur}}, \underbrace{I}_{\text{investor}}\}$
- both risk neutral
- E has an idea, no money. I has money, no ideas.
- Project costs K with return $\underbrace{x}_{\text{cash flows}} \geq 0$, $x \sim f(x)$
- E can see cash flows, I cannot.
- For cost c, I can verify x.
  - paid by entrepreneur.
- Let $B(x) = \begin{cases} 1 & \text{if audit} \\ 0 & \text{otherwise} \end{cases}$
- Let $r(x)$ be the payment to I
- want to $\min \; c\int B(x)f(x)dx$

  s.t. (i) $\int r(x)f(x)dx \geq K$ (Breakeven for I) (IR_I)

  (ii) $B(x)=0 \Rightarrow r(x) = F$
  - payment constant if not audit
  - can't condition on info. you don't have

  (iii) $r(x) - F \leq -c$ when $B(x)=1$

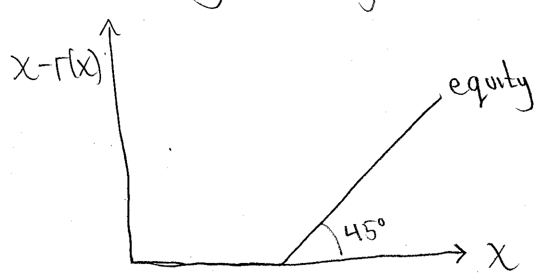
Defn: a straight debt contract has the following form
- If $x>p$, then E pays p
- If $x<p$, then E defaults and pays c and takes all $x-c$.

Result: a straight debt contract is the optimal contract.

Remarks:

1. What about equity? This is not a theory of equity.
2. What is "c"? In equilibrium, we can interpret c as bankruptcy costs
3. Ex post renegotiation is ruled out.

There is a Tirole-Dewatripont paper "a Theory of Security Design"



- They rationalize other functions in this space

Voting Rights (In public companies)

Grossman-Hart (Bell '80)

Question: How do we allocate voting rights to securities? When is one-share-one-vote optimal? What determines the value of corporate votes?

- We see this in the world, but we also see deviations from this
  - e.g. news corporations.

- Two classes of shares A and B.
- cash flows: s_A, s_B proportions $s_A, s_B \in [0,1]$
- votes: v_A, $v_B \in [0,1]$
- one-share-one-vote means: $s_A = v_A = 1$
- Two candidates for control: $\underbrace{I}_{\text{incumbent}}$, $\underbrace{R}_{\text{raider}}$
- R needs $\frac{1}{2} \leq \alpha \leq 1$ to gain control
- If I has control, then public cashflows y_I accrue evenly to all claimants, and I gets a private benefit of z_I.
- symmetrically if R has control.
- assume shareholders behave atomistically
  - shareholders are very small
  - eg continuum of shares and continuum of share-holders.
- Two types of bids; (no restriction on who can tender a share)
  - i) Unrestricted - have to bid for all shares of a class
  - ii) Restricted
  - we will focus on unrestricted bids

Example 1: $z_I = 0$, $y_I = 200$, $y_R = 180$, $s_A = s_B = \frac{1}{2}$, $v_A = 1$, $\alpha = \frac{1}{2}$.

- Suppose R tenders for all the class A shares at 101, and suppose $z_R = 12$
  - R will get $\frac{y_R}{2} + z_R = 90 + 12 = 102$.
- I will not outbid.

- This is a socially inefficient outcome that we think will happen in equilibrium.
- The B shares, in some sense, got devalued, because there was no point in R buying them.
- separation between control and social payoffs

Example 2: IsIV: $z_I = 0$, $y_I = 200$, $y_R = 180$, $s_A = s_B = z_A = z_B = \frac{1}{2}$