

Ec. 201; Old Notes

11 A Tu,

9:30 Th.

Ec. 201, Thurs. Jan. 6, '83

Highlights of J + L, Chaps. 1-6.

Why do people cling to obsolete, counterproductive
instus. like our wr. str. structure? Bcs. they have no
clear vision of something better.

"Rationalize" is the name for something better.
Many of its elements are borrowed & applied now &
then. They are "applied micro."

~~Engineers learn them, in part.~~

(Parts of this are called "eng. ec."; but ironically,
engineers thrive by becoming part of the problem, blanking
out selected parts of ec. rationality that stand
between them & their big toys.)

Our mission is to equip ourselves to do things better.

Ch. 1 Engineering Ec.

p. 9. Ec. life, planning horizon.

If anything involves layout, land planning, settlement
patterns, its effects outreach all physical structures. "Irreversibles".

E.g. the street of Boston, "Calf-Path", Sam W. Toss

E.g. Hiroshima.

p. 9 Nuke optimism. 1971. (Songs #1, 14 yr. life)

p. 10 "Construction horizon."

When stage 1 requires expansion. An interesting, problem worthy of our steel. Will study RIMS etc.

p. 10 Alts. must be compared over same pd. of analysis.

But what if they ~~last~~ have diff. lives?

- i. Use perpetuity
- ii. Use annual value, $a = P \frac{i}{1 - 1.0r^{-n}}$

Ch. 2 "Math of Ec. Analysis"

1. p. 17. cash-flow diagram.

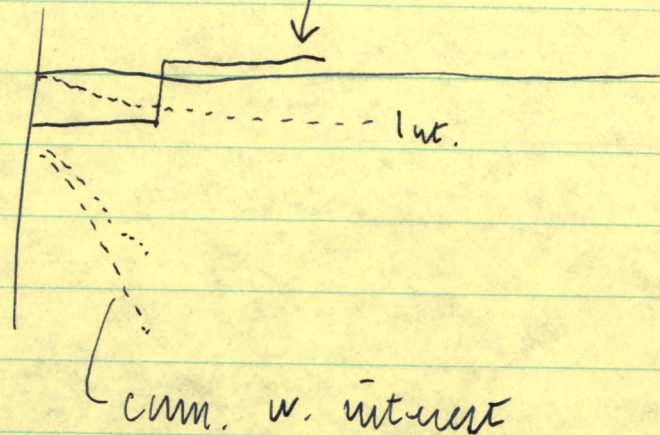
This is formally correct, + good introductory device, in wide use.

But for many purposes, ~~it~~ shd. be supplemented by a "Cash Flow Analysis". This focuses on cumulative unrecovered K at all times.

means Jan 1, $n = \text{Dec. 31, } n-1$

— current c.f.

n	1	2	3	4
ΔK_n	100	95	142	-
c.f.	-	-	-	20
$\sum K_n$	100	204	364	377
$i \sum K_n$	9	18.36	33 33	34
$(1+i) \sum K_n$	109	222	397	411



n	1	2	3	4
ΔK_n	100	95	142	-
$\sum K_n$	100	204	364	397
$i \sum K_n$	9	18	33	36
c.f.	-	-	-	20
$\sum_0 K_n$	109	222	397	413

ΔK_n on Jan. 1
 $i K$ on Dec. 31
 $c.f_n$ on Dec. 31

San Diego + Peri. Canal as e.g.

2. p. 21-24 Ship "uniform gradient series factors"

3. p. 26. Note A.C.E. uses factor where benefits come 25 yrs. after constn. This says a lot!

4. pp. 30-36 Needs extended ^{improvement} ~~discussion~~. Will return, re Ch. 8, B/C anal. See if you can improve on it.

Ch. 3: Micro. Old stuff

Ch. 4 Conditions of project optimality

a. p. 65-66. Basic error. Has Δ costs due to "discon. of scale" -- but misidentifies ~~discon~~ variable props. as one, p. 66.

b. I use product & cost curves, not indiff. curves.

c. p. 84 stylized LRAC curve, not directly applicable to res. decmnt., where adding land is difficult.
But if we do, I prefer NP of land analysis.

5-

d. Nothing said about 2d Best.

Ch. 5 Welfare Ecs.

Ch. 6 Discount Rate

Next ass: Inst'l. Setting

Ch. 7

Reminder of Kurb, on who. law.

afes

T-release



	<u>Rip.</u>	<u>App.</u>	<u>Corr.</u>	<u>Ec. System</u>
Initial Allocn.		Scarcifying	Over-allocn. Land	
Motive to develop	Inadequate adequate	Rule of capture Excessive	Inadequate	
Constraint on unrec. use, or amt claimed (Consum. effic.)		Negative		
Rationing in scarcity	p. 149-150	No pooling, but vert. int.		
X fr.				
Pooling			Vert. intn.	
Aquifer mgmt.	Surface flows take priority	Surface priority (on underground streams)		
Cont. Service Area				
Distr. Equity		Prin. land		
Scarcity				
Dynamic Evolution				
Loss of rts.				

Initial Allocn.

Ration in Shortage

Integration

Transfers

Distr. Equity

Cont.

Storage

Effic., conservation, economy

Dynamic evolution

Am't claimable

Loss of rts.

Motive to develop

Mgmt. of aquifer

Ec. 201. 2/1/83

Doc: Hurley

I. City Imperialists.

Once started, they had a mopp. of xfrs. for long time.

L.A. 1907 -

S.F. 1914 - 1934 (filings pre-'14)

EDMUND -

They had:

- Pueblo Rts (h.a. & s.d.)
- Domestic priority
- Superior fringes
- speculative fringes --- unlike I.D.s.
- exempt from diligence

Rural-urban combat is overplayed

- I.D.s serve cities
- City systems serve farm wto.

Interregional conflict is the thing.
Law of cfr. disadvantage.

SF.	Claims	400	mgd
	Capacity to take	160	
	Taken	120	

SF 74

Alb 47

II. State Organs.

1. Hamm Hall, gadfly
2. Col. Marshall, full integration.
Kerr to Monro.

3. '30s, bankruptcy, Feds.

4. SWP. 1960

Mainly to stop 160 a. law.
(Irony of state constn.)

5. No intn. New separate, uncoord. project.
For MWD expansion, + W. Side.

III. Fed. Agencies.

Navig. Act, 1824. Logrolling. Flood Control, '44.
Recl. D.R., 1902. More repayment expected.
Agency w. Mission, Ideology.

Pvt. power. 3d party. "Preclusive Underdev." vs.
full devmt.

Promotion, collapse + disgrace, 1930. Multi-purpose
public ~~power~~ devmt. Moved in.

Contributors:

1. Full dev.

Put. dev. act like Cherning's sharecroppers.
No pay. $\therefore$ take as much as allowed, underuse.
to MNP land = 0.

Weak collections policy.

Control wtr. allowances after delivery.
Limit wtr. to ec. use. E.g. Madeira I.D.
Control land allowances - BR. si, AE no.

2. Cheap power, discover ~~it~~ elastic demand.
Esp. welcome in '30s.

Tax-exemption helped.

3. Added a wholesale stage above non-orig.
stage. Sought to integrate.

4. Multi-purpose. From 1906 Salt R.

5. Power pools.

6. Integration. TVA & Mo. did much better
than C.V.!

1. Return flex. wtr. allocns.
40-yr. ge contracts.

Faults:

1. Giveaway. No recompment.
Windfalls.
Dependency.
Poor current or perish. Agency rivalry.
E.g. F.K canal built before repayment contracts, BR had no bargaining power.
2. Partial funding.
Too many starts; too few completions.
Agencies prefer starts to completions.
Logrolling aggravates.
So, replace half-sized projects w. half-finished ones. $i = 0$, time stands still --- a free good.
To unlock our lands & wtrs, lock up our K.

5
Over-expansion, Artificial abundance.
Wtr. goes to cheap uses for decades.

Obsolete intent - subjection to irr., uneven;
flood control. None to pollu. control.

2/10/83

1

Welter of Ideologies: competing, intertwining, +
sometimes reinforcing (if not coalescing)

1. Democracy. Common heritage idea.

o. 1783-92, Confedn. confisc. Tory lands. 1787 ord.

a. Jefferson, 1801-09

La. Redistrib. every generation. Bill of Rts
Decl. of Indep.

b. Jackson. pro western settlement; "anti-bank"; strict
construction [†] vs. expansionism.

c. Lincoln. Free Soil, Homestead, emancipation. also vs.
expansionism.

d. TR - Taft - Wilson.

Much wilder. Progressive era, more elitist.

~~o. FDR~~ End in ~~war~~ for war + reaction.

Bus. democracy petered out, western lands much more
concd. than eastern.

2. Aristocracy.

Squirearchy.

Wash. the speculator

Madison the courtist.

Hamilton the criviste

Monroe the country gentleman

Adams + Adams, intellectual Bostonians.

See-saw battle of court. vs. expansion

George III vs. Colonists

Hamilton vs. Jeff.

†

Jackson wanted western bank credit to settlers: not monopol. by eastern absentee

Safety-Valve Theory.

Boom: flow of K

Bust: flow of people -- sometimes.

Whigs (J.R. Edmunds) vs. Jackson

Abolition vs. Lincoln

Court always lost, but aristos. got involved in land spec.

Civil War wiped out aristos. Succeeded by plutocrats.

3. Plutocracy - rule of wealth; defense of property.

auri sacra flamma, accused craves for gold. -(Vergil)
as Vahlen notes, has no limit.

From 1868, dominant.

Gradually took over econ., too -- now supreme.
(Smith & Mill were for democracy)

Hindelofer & Rand on water. Give owners a pink slip, solve all.

Idolatry of econ. of scale. Larger landholdings always better. Focus on costs, ignore yields & land costs.

Ability to raise ^{front} money is a sign of divine grace, predetermination & election. Efficiency, emergency.

Chicagoans object to public money spent w/o recompense. But not to giveaway of land or water. & recompense must always be by user charge.

4. Theocracy.
 a. New England.
 Gave us our nat. land system.
 " " " education " " " lands reserved.

Also origly. authoritarian, coalesced w. democracy. Edn. gradually replaced land as the coin of equality. But land supported edn. -- pre-juris.

b. Desert

Fractional war, etc. Shared risk.
 Sam B.

5. Populism

Attempted revival of democracy, by small landowners
 Failed to win nat. power; but dominated state + local thinking, many areas.
 Tax big owners; regulate or socialize xpt-utilities.

Wright Cret

Huey Long

6. Socialism

Never strong in U.S., except re p.w.; mun. services; edu.; armed forces.

S.D. cement plant. Mke. never socialism.

CCF, NRP, merged pop & socialists.

7. Utopianism.

Many iron colonies and strong elements. Canaanism, Ontario.

8. Ethnicism

Ethnic colonies. Norway. Canaanism. Dairy colonies; various colonies. Italian Swiss. Italian

Alien Land Law. "Native Virtues" -- anti-oriented. gap. relocation.

9. Militarism (Manifest Destiny, Mercantilism, Imperialism)

A unifying theme. Trans. exp. jobs, land spec, inv. outlets, military action.

Rule of capture; approp. doctrine; land settlement; fertility --- all work together. Immigration too.

10. Individualism.

11. Legalism.

Defends property, but also limits it.

Re wtr., has led to bizarre results -- license to waste.

Law is a set of rules w/in which battles may be waged. The poor always have a chance --- but they have to use the apparatus that has been handed down to them.

12. Technocracy.

Idolatry of Engineers, & c. experts.

Heritage from older times, engs. were the only smart & honest men around. Progressive Era, ~~to~~ Veblen, Coors, & the Gospel of Effie.

Nat. level, culminated in H. Hoover, Wtr. res. still w. us.

Faults of engs.

1. Insatiable demand.

2. $i = 0$

3. Empire bldg. Ally w. land spec.

13. Fear fundamentalism.

14. Conservation (environment, ecology, recreation, amenities,
common heritage) Subst. proful. argumt. for mkt.
decisions.

Full Devt., lock-up ("pygmy dams"); optimize.

Land Distribution.

1. Most went to a few.
Important remnants Today:

Irvine

O'Neil

SP

Tanuco

George, Gates, Meyers, Billington

2. "March of Conch."



1900-80

3. Highly ^{cyclical} spec., destabilizing.
Cole, p. 241

Banks ~~invest~~ formed to LM on land sales & inc. improvement. Boom & bust.

When we come to risk, remember!

Mixed bankruptcy.

Akoliski, Robbins, Hofstadter, M.G., Tax Del. Land,
Hicks, Osgood, Billington.

4. Com. Tudey. Nadu.

Land Policy

Various Themes.

1. Cash sales.

a. Proprietary Colonies like Pa, Md, Ga.

b. Min. price. 1.25/a, to 1862 (also after)

c. OCS leases.

(also tax exempt.)

Problems:

Front. money bias. Hi concn. Scatter.

Partial offset: local taxes; minority to absentee.

2. Land as reward.

Vets. scrip. (~~that~~ Before this, vets got all; now, get little or nothing.)

Negotiable. often sold for cash

2

3. Land as ~~reward~~ ^{incentive} for p.w.

RR grants.

Alt. sections

Bld. road, raise l.v., sell land,

also locate cities, sell town lots.

Frauds on gigantic scale. U.S. Grant, era of corruption.

4. Land as reward for settlement

a. Squatters rts.

b. Homestead Act.

generally got the land.

Rent-seeking behavior

c. (Credit sales, to 1821)

5. Land as reward for discovery

Minerals. 1920

6. Land from prior govt.

a. Spanish grants

b. Indian res. (Eskimos + Aleuts, too)

c. Desert. Legal fictions.

"Force + fraud." Little that is sacred.
Bribery, corruption, conflict of interest, was
standard.

There is no moral basis for existg
distr. of prop'ty. It is a fait accompli, that is
all.

But it raises to a high peak the qn. of

4

distribn. of benefits, & recoupment of costs.

If the value of land is 90% imputable to
p.w., & the landholders paid for these, then
property is justified, 90%. So the gr. of
imputation is of high importance, morally.

Also looking to future, as p.w. wear out,
const. replacement needed

B/C Anal., Ideas.

1. Max $B-C$, not B/C .
2. Separable discrete segments often used
3. Proj. selected must be better than any precluded also.
(Green Bk. superior on this to JPL, + others, who
widely missed point!)
4. Priority.
 - a. "Best first". But:

Std. Fed. govt. round out "low quality" Tail
of #1 proj. "before" doing hi quality core of #2?

i. If all projects can be augmented Δ ly at any
time. ~~xxx~~ "Divisible in Constr." This makes it easy.
Under this ass, the only indivisib. is the leap to
max. AP of #2 proj. (in general, the unqual.
proj.). Begin #2 ~~as so~~ when max AP of #2 =
MP of #1.

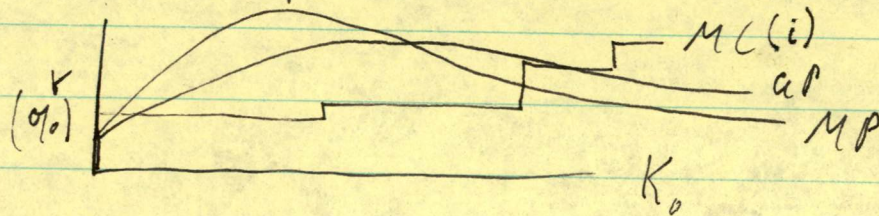
ii. If have more projects than you have K to
bld., set shadow price on K (or other limit) to
screen some out. This is yr. internal cost of K .
(But then sell ^{some} sites to others, to use their K .)

5. Modified method.

a. The method of using \$1 of cost as abscissa unit is in GB, p.12

They were built in \$ (of PV, no doubt)

b. I modify to more familiar form

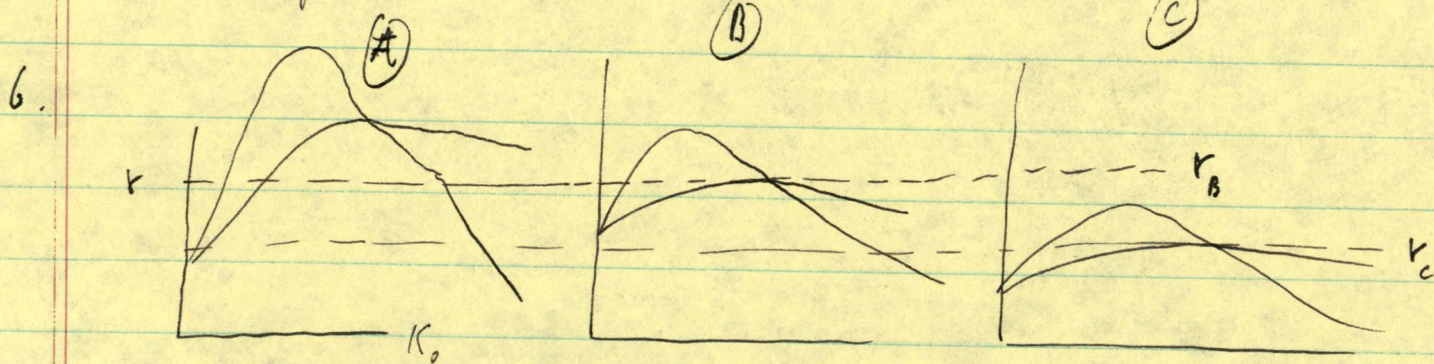


Higher i raises MC .
Other Δ costs lower P

- wage rates
- intels, cement
- shorter life
- hi op's costs

Low demand also $-\Delta P$

(The steps in MC are optional -- may not occur for one small project. May not occur at all, if expansion helps credit rating.)



→ 5 b. How find i ?

Proceed by increments — thus avoid fallacy of imputing rent to K_0 , which happens when you use AP

In calc'g i.r.r., the calc. itself is so complex, is easy to skip the vital step of proceeding by incrs., & then to calc. an AP i.r.r. instead of a MP i.r.r.

More often than not, i.r.r. is abused: used in such a way as to arrogate rent to m.e.c. or return on inv. (r.o.i.)

How to find i.r.r.

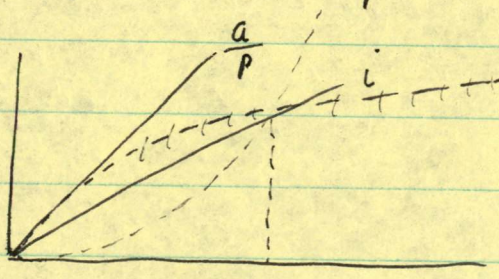
$$a. \quad F = P (1+i)^n$$

$$i = \left(\frac{F}{P}\right)^{\frac{1}{n}} - 1$$

$$b. \quad F = \frac{a(1+i)^n - a}{i}$$

$$P = a \frac{1 - (1+i)^{-n}}{i}$$

$$i = \frac{\frac{a}{F} [(1+i)^n - 1]}{1 - (1+i)^{-n}} = \frac{a}{P} [1 - (1+i)^{-n}]$$



$$c. \quad P = a \frac{1 - (1+i)^{-n}}{i} + F(1+i)^{-n} \quad \text{over } p.3A$$

$$d. \quad P = a_1(1+i)^{-\frac{1}{2}} + a_2(1+i)^{-1} + \dots + a_n(1+i)^{-n}$$

$$p = \frac{a}{i} - (1+i)^{-n} \left(\frac{a}{i} - F \right)$$

$$p - F(1+i)^{-n} = \frac{a}{i} (1 - (1+i)^{-n})$$

$$i = \frac{a [1 - (1+i)^{-n}]}{p - F(1+i)^{-n}}$$

Carter's Method: $i \approx \frac{a}{p} + \left(\frac{F}{p} \right)^{\frac{1}{n}} - 1$

$p=1$	a	F	a/p	F/p	$(F/p)^{\frac{1}{n}}$	$\approx i$	i
$n=10$	.01	0	.01	0	$0^{\frac{1}{10}} = 0$	-.99	-.288
	.05	1.0	.05	1	1	.05	.05
	.15	1.2	.15	1.2	1.01840 .16	.1684	.1594
	.11	.80	.11	.80	.9779	.0879	.0972
	.11	.50	.11	.50	.9330	.0430	.0745

Carter really goes off the mark when $F < p$.

d (cont.) use HP 38E.

E.g.

$$\Delta K_0 \quad \Delta \left[\frac{a_1 - a_4}{1} \quad a_5 \quad \frac{a_6 - a_{10}}{4} \right]$$

10 1 3 4

$$i.r.t. = 16.99\%$$

7. "2d best"

Use real social costs + gain.

a. Gains

- Est. mkt. price of farm crops, w/o supports. In practise, not done.

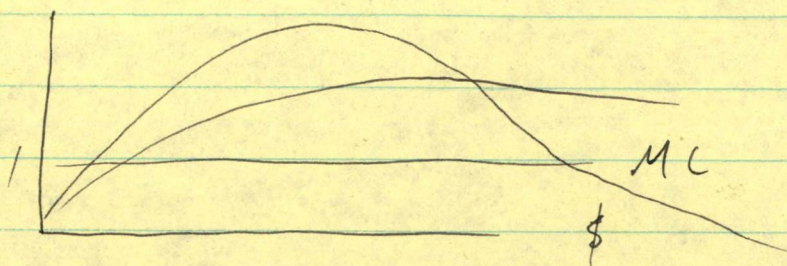
- Consider effect of Δ supply on price. Again, not done. CVP + SWP cases.

b. Costs.

- Zero cost for unempl. labor?

- Add taxes to i.r.t. cost of govt.

B/C



1. Use of \$ as cost unit.

a. Dams have many dimensions.

Ht

Thickness

Quality of mtrls

Shape

\$ msre. assumes = wght. alloc. among the features.

b. If costs rise, product curves fall.

Effect of hi & low i.r.

c. \$ made commensurable in time.

i. \$ of PV

ii. To cf. alts. of diff. life, annualized \$

are better.

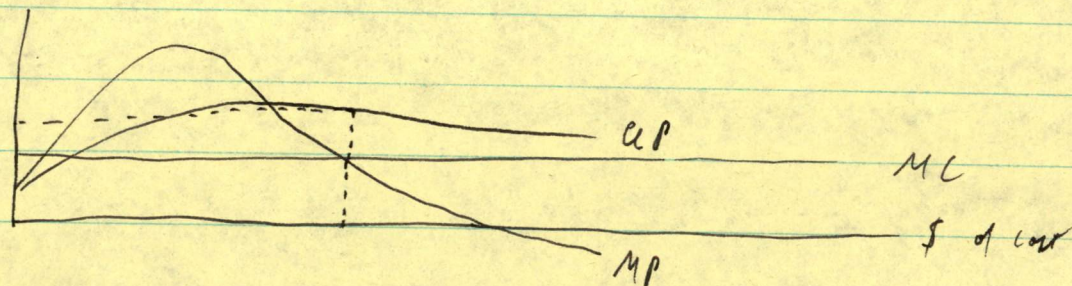
$$\text{Stream of Net Ben.} = \overset{\text{DCF}}{\overset{''}{PVB}} \frac{r}{1 - 1.0r^{-n}}$$

$$\text{Stream of Costs} = K \frac{r}{1 - 1.0r^{-n}} \equiv \text{debt service}$$

2. $MP = MC$ as max eff.

a. Mgrd. reasoning.

b. Max rent of rate = $TP - TC = (aP - aC)Q$



c. $Eff = \frac{TP}{TC + R_{Max}}$

at R_{Max} , $TP_M = TC + R_{Max}$

$Eff = 1.00$

Any other point, realized rent $< R_M$, $Eff. < 1.00$

3. Why dump rats to dumps?
- a. Res. fills less often, over time.
 - b. Wtr. must be carried further.
 - c. O.C. of res. site rises
 - d. Weight + bulk, same as chyscrapers.

4. Fallacy of max B/C
Same as max CP

→ Indirect approach: fallacy of max I.R.
Counter: enter max rent as explicit cost.

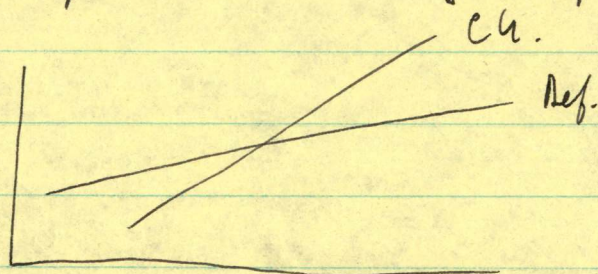
5. Fallacy of "full use" $MP = 0$.

6. Inverse relation of MP
Fox on Fisheries, fallacy of

7. 5 kinds of feasibility in J & L
- a. Eng. It must "work". Vague. Peri. Canal Fish Screens? Have Barrett's rail pipeline? Nauwapa?

b. Economic. $B > C$

i. $W + w/o$, rather than before & after.
 Important. E.g. a new bldg. replacing old, rents
 rise



Is part of age-old process of limiting
 the credit people claim to what they deserve.

ii. Inadequacy of $B > C$.

This can justify pygmy dams etc., unless
 enter rent as cost, at max level.

c. Fuel, Can raise K .

i. Lender risk vs. Investor or Equity risk.

ii. Benefics. must be orgd. so they can pay
 -- Mosquito Disors, Drainage & Flood Disors.

iii. Much is fully feasible but not ec.

Subec. projects grab credit of sound ones. Whoops & Bonaville.

5-

Rev. Bonds do not stop this; but aggravate
repayment problem.

d. Political

e. "Social"

I & L mean, will people accept.

(f). Timing (Ch. 9)

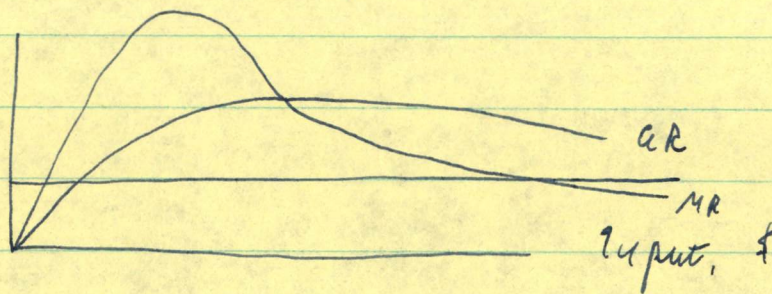
(g) Distribution

Recompent the answer

1. Outside subsidy vs. tax & benefits.
2. Benefit assessm. vs. ad val.
3. G.O. Bonds vs. Rev. Bonds.
4. off balance sheet bonds.

B/C

1. Dim. rets + opt. scale,



$$\frac{MP}{AP} = E;$$

a. Income MP

b. Tragedy of commons.

c. MP as system concept

d. Fallacy of max B/C - Pygmy dams.

e. Nature of dim. rets. to hi dams

Less frequent use.

f. Fallacy of looking o.c. of site

"Made land" + silting of Boston Harbor.

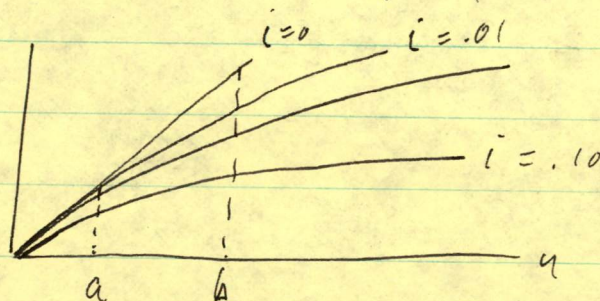
Ec. 207

Thurs., 2/24/83

B-C anal., III

Topics

1. a) We saw how higher i.r. screens out unqual. land,
Bes. K compl. to land.
- b) But main + prime office of hi i is to ration K,
not land. Std. even cause sub. of land for K.
E.g. ... improve less intensively + less often.
- c) also, shortens life of K. Screen out long lives.



Graph shows how longer lived PV suffer higher
to loss from Δi (begin by diff. $i=0$ vs $i=.01$)

Now reconcile b + c. Recover K sooner,
leave carcass longer.

d.) Net effect on unqual land?

Hi i is not a cause of short K, but a
result, + a partial cure. It makes the short supply
spread around further.

2

So net effect is to draw in margins. But K is very plastic, given time; so if i.e. can flex, the ~~boundaries of~~ spatial margins need not contract catastrophically. There are 2 other margins to absorb shocks: intensive; + temporal.

The major effect, in our migratory society, is to slow down expansion, rather than cause absolute contraction. But bcs. of regional unbk. ~~are~~ in new growth areas, heavy dependence on cap. inflows, this can cause a big ebb of workers.

Marginal lands are often K -int.:
timber
reclamation
frontier oil

Hi i.e. is assoc. w. ec. catastrophes, where K has been misinvested + frozen, i.e. not plastic. This can be cumulative, bcs. taken K to use K : i.e., taken working K to use fixed K .

Analogy, big logs + little.

In recl. proj., small prt. K needed to fructify monumental public invs.

2. Choice of disc. rate.

a. S & L choose lower rate

i. Implications for tax-shifting — so obvious!

ii. No social justifi. A legal matter?

But no legal basis either. Cf. salaries of local employees.

b. Fed. bonds are taxable (but not by states)

i. No corp. tax. Some would add that.

c. Fed. credit can force anything, at risk-free rate.

Means needed to allow for indiv. project risk.

It need not be in i.r.

Decision-makers do not suffer from proj. losses.
Creates bias to go into risky things? Not really —
they don't gain from success either. ~~A new~~
To understand net results, must study hist.
& pol. sci. & org. thy.

Peters & Waterman, In Search of Excellence.

2.

d. Conclusion

Use i.r. much higher than currently in use.

Avoid, above all, the fallacy of pension fund abuse:

WAC Bennett, B.C. Hydro
Teamsters

Cal. Tchrs.

Soc. Sec.

TLA

Bankrupt Corps.

3. Pd. of analysis.

Tendency toward arbitrary horizons. — wrong.

All future time.

Discounting keeps dim future in perspective.
But allows for big things -- e.g. future nuclear catastrophes still have hi P.V.

i) Practical way, most cases, is to annualize

E.g. LONGS, #2 now can forecast 10 yr. life.

1090

$$\begin{aligned} \$90 \text{ M @ } 25 \text{ yrs, } a &= 90 \text{ m} \times .11 = \$9.92 \\ @ 10 \text{ yrs. } a &= \quad .16 = 14.65 \end{aligned}$$

$$\frac{14.65}{9.92} = 1.48$$

Add decomm. costs of \$25M ~~in 10 yrs.~~

$$\begin{aligned} @ 25 \text{ yrs, } a &= 10.17 \\ @ 10 \text{ yrs. } a &= 16.22 \end{aligned}$$

$$\frac{16.22}{9.92} = 1.64$$

ii) Cfs. proj. of diff. life, is vital to annualize.

$$\begin{aligned} \$5 \text{ for } 50 \text{ yrs. from } K_0 \text{ of } 20 \\ PV &= 49.57 - K = 29.57 \\ a &= \end{aligned}$$

1090

1. Land-enhancement as unre.

a. Is a DCF net of costs

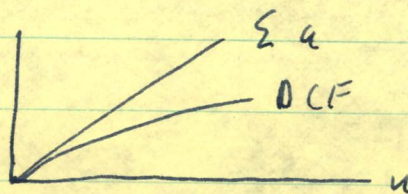
b. Not same as income.

Income comes in 2 parts:

- Δ wealth

- return on Δ wealth, over time

The 2 together are Σ of all inc., over life of proj.



c. Also captures Δ benefits critic. from "total community".

d. Sources of overest. benefits this way

i. L.V. may include assumption that others will pay to renew project later - e.g. CWP.

ii. L.V. often spread over more land than proj. can serve, b/c of lag in dev. CWP again.

iii. Unit L.V. rises & falls w. waves of herd psych. as well as i.v.

iv. Landowners organize, apply political pressure.

v. L.V. may go up for other reasons.

Project raises b.v. by ΔP .

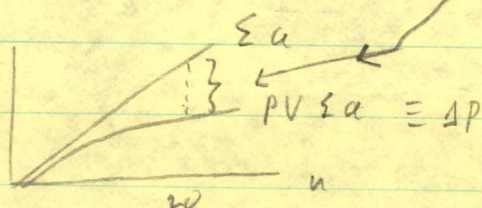
ΔP is current inc.

$\Delta a_1, \dots, \Delta a_n$ is also inc.

a. Let proj. have finite ec. life, so benefits stop after 20 yrs. Then there is a ΔP_0 , which deprec. away. Inc. consists of 2 parts:

$$\Delta P + [\Sigma a - \Delta P]$$

$$\Delta P \text{ is } \sum_{i=1}^n [a_i (1+i)^{-n}]$$



Hair- Simmons wd. recognize ΔP at $n=0$; but then let you deduct it over 20 yrs. No double counting.

Proj. benefits are not same as taxable income. You just want the PV.

As for individ. his income comes in 2 parts:

ΔP comes first; Σa - deprec. (if any) comes later.

If no deprec. then there are 2 incomes.

Work an
entire.

2. "Income" as msr ,
or "Net Proceeds".

Land income, ok. This is rent, or cash flow of land. But to annualize, must deduct K_0 , etc., so you must go thru same process as ACI or $L.V.$

Pitfall of income.

a. May omit Δ value of land not used.
Cops out on qn. of how to define income.

b. May go to in personam
- include inc. of imported $K +$ labor
- exclude land rent, if mortgaged

Conclusion: use Δ L.V. with discretion.

3. Income distr. benefits.

a. joke.

a. If subsidy who pays?

Fed. publ. inc. tax is "not sensitive to
inql. changes in rev. requests."

Dubious. Payroll tax grows fastest.

Also, looks at inc. tax thru rose glasses.

b. Proj. spending.

Loaded! p. 175

Skilled workers wd. have jobs anyway.

Unskilled wd. be unemployed

Nonsense. Big lobbyists are:

Eng. groups, agencies & consultants.

Inv. bankers.

Suppliers of mtrls & generators, etc

Comm; generators

Contractors

Energy

This is where mainstream ec. is so sterile &
unrealistic: PE needed. Any facto. reporter knows

where the thrust comes from.

They cite one of selves, D. James, & Rick Freeman.
Shows depressing blindness of AER eds., etc.

c. Proj. Benefits.

Dismissed in 2 sentences!

We have seen conc. of land; & esp.
spec. holdings in growth areas.

Cite David, in Hennis book
Self in Freeman

Such blindness cannot be accidental.
It is culturally conditioned

4. 8-14, Proj. Installation Cost.

a. Units escalation.

Overruns are standard -- & it keeps working!

b. Units delay in constr.

Cf. 100 vs:

$$10 \frac{1.12^{10} - 1}{.12} = 10 \cdot 17.5 = 175$$

$$5 \frac{1.12^{20} - 1}{.12} = 5 \cdot 72.1 = 360$$

Buss. do not begin until constn. completed. —
not like house.

c. What i.r. during constn?

High! Constn. loans vs. take-out
loans.

5. Probabilistic variations. 8-16

a. Mean values must be modified for variability —
but no one knows how.

b.

Ec. 201, Tues, 3/1/83

1. Given Proj. ^{Notes} A, B, C. Life = 40 yrs. or so.
Build A first. ("low quality")
Do you ~~not~~ press on the intensive margin of A before bldg. core of B?
- a. If you must choose, it means you are short of K. Raise shadow i, proceed accordingly.

b. In sizing A, you are guided by est. of demand over life.

- Forecast this

- Discount it. Cap. frozen now to meet future demand is useless until demand appears.

You are always involved in this trade-off: ΔK_0 of added capacity is less if incorp. in orig. design; but payoff is deferred.

- The causes why ΔK_0 is less at start are several:

- i. As above, ec. of all-at-once. (Indiv.-in-const.)
- ii. Ec. of scale, if in stage I
- iii. "Rising constr. costs" - an illusion?

- Accelerate demand, as by LVT

2

c. Deferral of demand ^{acts} ~~argues~~ vs. rounding out A's intrinsic margin. But it equally or more argues vs. ~~the~~ B + C at extreme margin. So it is even-handed -- just cuts down PV of all MP from inv.

d. Longevity always entails cost of mismatching capex. + demand over considerable pds. $\therefore$ keep everything flexible as possible.

~~Most~~ common error: overest. value of saving on K_0 by bldg. all at once. The Am. fetish for scale, monuments. Engineering egos! "To unlock resources, lock up K ."

It's ok to round out int. inv. with labor; + invts. of fast return. These make jobs, ~~the~~ a main social objective of resource devt. Thus unlock res. w/o locking K .

(It depends on whose objectives. Bankers want to have K used heavily, + they dominate much policy. Big bankers esp., like big projects, that is their province.)

e. At any time, no. of eligible project sites is finite.

Best ones already devd.

Subseqt. ones unripe.

But many of the old ones need reworking, expansion or replant. -- + the demand is already in place. "Am. in Ruins". Here is hidden sink for K, next decade. (If we can get it back from Mexico, et al.)

f. Rounding out old projects ~~can~~ is incremental; beginning B or C requires discrete initial jump. This argues for A.

Esp. when add assoc. costs of B + C.

~~g.~~

(Risk: Δi adds to risk of not recovering K. Circular - beware!)

(Risk: i may Δ after you lock up K at lower return.)

g. Adding B or C involves taking more land from alt. use.

The alt. use may be valuable. Knight ~~et~~, Friedman

et al. talks of "making land," as if from nothing.

But:

Boston taken from harbor, caused siting of navig.
channels, 1850s.

SF. Bay

San Francisco + New Melones

Cities + farmland

Forests + farmland

2. "Assoc. Costs"

Public

Pvt.

3. Treatmt. of taxes.

Δ tax profits are part of Bens., just as Δ public costs are part of costs.

4. Kinds of Benefits.

a. Primary.

Physical; direct. (Assumes no change in land use!)

b. Indirect

Incidental, by-products. May be physical.

c. Land-enhancement.

Caused by higher use of land (i.e., entails ΔK)

Vague. Cause of confusion.

d. 2dry

"Secondary"

i. Downstream

ii. Upstream

e. Employment
Direct & indirect.
"Area Redev." — i.e. regional. A scam.
means you count new jobs in region as net gain!

f. "Public Benefits"

Ec. Stabilizer

Inc. Redist.

Env. Quality

Wrongly, J & L exclude this from "effic.", p. 167.
(Left out Nat. Defense)

g. Intangible

Sav'g life

Health

Esthetics

5. Kinds of Costs

a. Associated

Priv.

Public (by non-sponsoring agencies)

(e.g. U.S. Navy in S. China Sea)

b. Induced

E.g. drainage below irrigation.

6. Msrq. Beni.

a. Follow demand curve, not supply. "(Avoided cost" as msre. of value of electr. under PURPA.)

b. Income of benefits?

Beware using in personam for in rem

- debt reduces income

- inc. includes inc. of assoc. inputs.

"Net Proceeds" better.

Disc. NP better yet. But this is same as Δ l.v.

Δ l.v. is best msre. Problems:

- mkt. goes wild in booms, sour in busts.

B/C Variation

1. Probabilistic approach.

Flood control based on known freq. dist.

Load mgmt. based on known load duration curves (demand changes)

- mix of power (or wtr) sources w. different
ratio of fixed/vble costs

2. Customers submit demand sched. instead of:

a. Cutting off js.

b. Pro-rating

This handles both peak demand & trough supply.
It uses price as a variable rationing tool.

Atty. can change rates ~~to add~~ in pattern which you think will clear mkt., or help -- handle remainder of problem just as we do at present, by reserve capacity. This is normal meaning of peak-load pricing (which has developed in indus. where demand varies. Wtr. may be an exception, where supply varies.)

Also:

Load mgmt.

Interruptible service

3. A deeper problem: mean values cannot be predicted. Call this "uncertainty".

4. To reduce risk

a. Shorten lives — speed up payback. Shorten commitment period, the pd. of helplessness, K in distress.

Many aspects of speeding payback.

- short constr. pd.
- quick cash flow (not like S.O. + (PP))
- low i. p. 2A
- invest in rehab, maint., & repair
- etc. "Trust no future, however pleasant ---"
- Put hi quality K on base load; accept hi op's costs on peaks. Or avoid cities w. low mkt. share, like Kroger.

b. Avoid "instruments of low quality"? p. 2C

c. Accept small chance of "failure" in pref. to heavy K. outlay. (i.e. failure to serve).

~~Some~~ Moderate "failure" by a, Flex. price, etc.
b. Peak load capac. on standby, w. low K-intensity.

Hi i.e. increases "risk" by high multiple of the rate A , where risk means not getting back K_0 .

If int. is explicit, this is real.

If "int." is a target rate of return, this can be imaginary. Let $i = .15$.

a/K_0	n
---------	-----

.15	∞
-----	----------

.16	19.8
-----	------

.17	15.3
-----	------

.18	12.8
-----	------

Thus, a drop in a from .16 to .15, (a $6\frac{1}{4}\%$ drop) extends payback pd. from 20 yrs. to infinity.

The equity investor puts his income at risk, and gives cap. recovery priority over income. Thus, a 6% drop in a is just that, & not a loss of K .

The leveraged entrep., 100% fixed, has no such choice. The 6% drop in income means he never pays back K_0 . A 7% drop & he misses paying interest, goes belly up.

To p. 2B

Note how Δi extends payback pd. $a/K = .18$

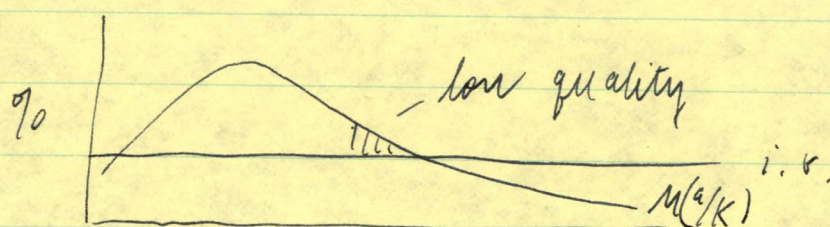
i	n
.14	11.5
.15	12.8
.16	14.8
.17	18.4
.18	∞

Note how highly sensitive things become as you approach $i = a/K$. This is another reason for avoiding long life.

Note how risk premiums in i.r. aggravates risk.

"Increments of low quality"

a. Typical use in r.e.



But this is asymmetrical, bcs. of variable props. Land is also an invt. Applying same logic, std. also reduce land -- but that puts it back into low quality range, etc.

What is behind this? Usual pattern is, developer owns land, financ. bldg. Thus land cost is imputed to at risk. Result: underused land.

Govt. also owns land. But doesn't have to do this, bcs. can borrow on other collateral.

Logic appls. of idea of Δ s of low quality

i. Wrt. scale -- land + K

ii. W.r.t. prop / labor.

d. Be prepared to recognize errors + about losing ventures. "Know when you're knee-deep in the big muddy." Shoot the wounded. ‡

e. Many small experiments. - fast.
Avoid "betting the store"

f. Stage constr.

E.g. Erie Canal - ea. segment self-liquidating. Revolving fund principle.

g. Study history. Beware of failure patterns
Muscovites

Spanish Armadas

Herd behavior: sheep + humans

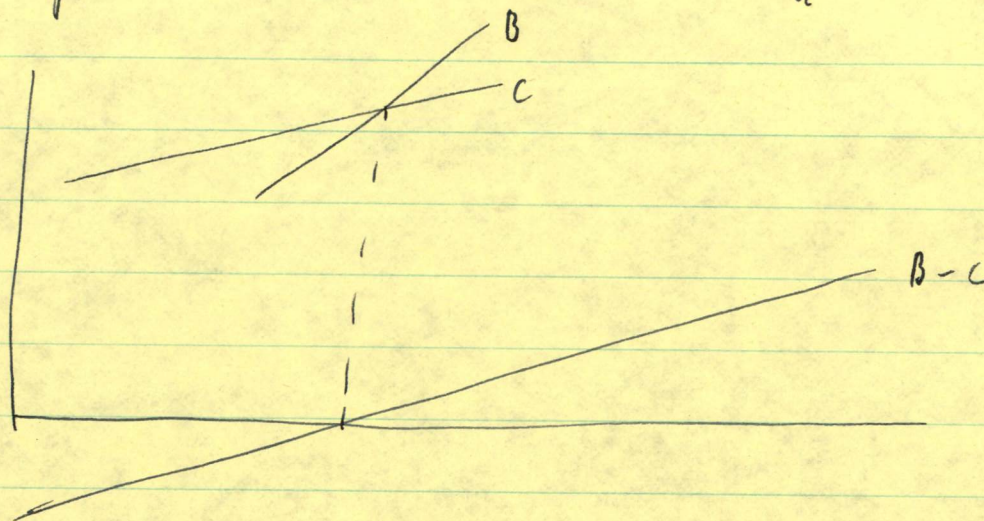
Idolatry of scale, blind to obsolescence

Distancing from customer

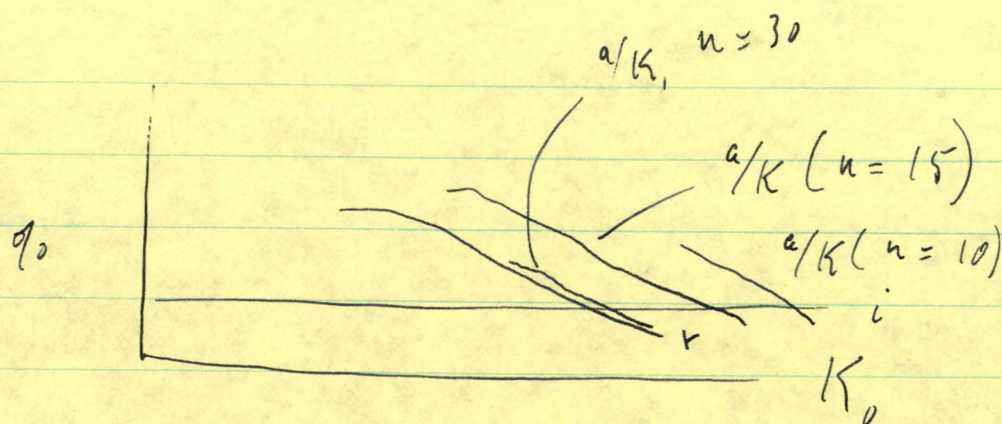
" " workers + operations

‡ Don't throw good money after bad, down a rat hole.

Opt. Constr. Date. Where to build what?



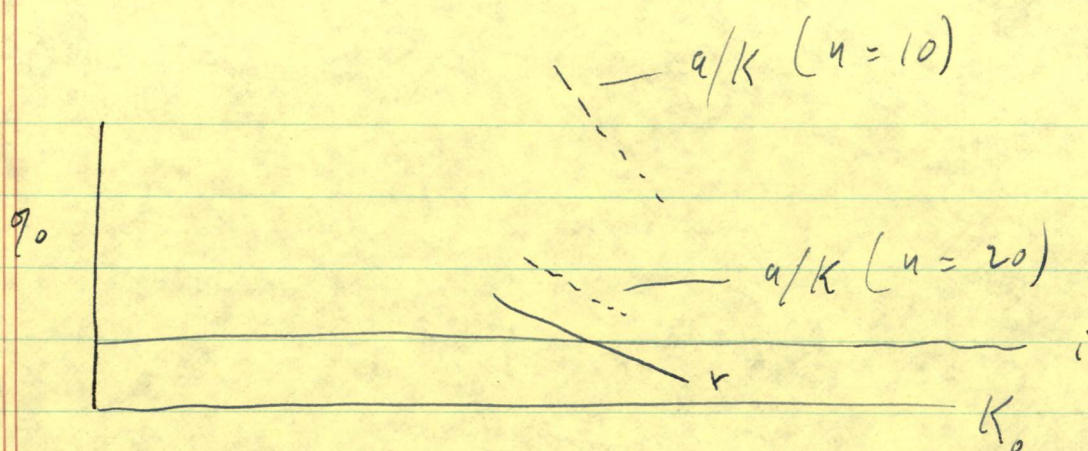
- a. Approp. Capture date - Too soon,
- b. Mqul. Date.



Is a hard doctrine, of ec. thg, to assign v.c. to K & land. But is correct. Express risk in terms of not recovering K --- at the o.c. rent & i.r. (~~what~~ as they vary over life.)

This steers you away from long deferred recoveries. Probably — unless you think i & rent will fall.

Spreading risk conceals it.



How many coats of paint? Any car. coat adds one year to life, before next paint job.

a. Discount future value.

b. Dim. rets. bes. the boards may rot or obsolesce for other reasons.

Land is a stabler base than boards, hence justifies more longevity.

But less so if you change o.c. to land. Role of land in longevity is partly to arrogate rent to cover risk, wrongly.

Rdgs ^{+ ideas} Dynamics, Risk. Pd. of analysis.

1. f + w, passages
2. W. non-storable things, ~~not~~
 - variable supply worth less than its mean value
 - variable demand requires control of supply
 - "firm supply" is one that meets any demand, requires redundancy.
 - flex. price reduces need for redundancy
 - periodic excess supply led. go to produce things that can be stored

W. storable things,

- storage is costly
- flex. price reduces need for storage

3. Risk of failure or non-performance or ^{occasional shortfall} ~~peak~~ (peak demand or trough supply)

4. Risk of fincl. failure to fincl. entity, loss of control, loss of equity. Cash-flow shortfall, missing a print, etc.

1. J + L

pp. 8-9, predictive uncertainty

9-10, planning horizons

181-86, B/C variation

181-85, The probabilistic approach. (Load duration curve)

186 Limit. Anal.

Ch. 9, Dynamics, pp. 197-228

pp. 476-81, specifying uncontrolled events

(just to get a flavor of opt. by simulation, a chap-
otherwise ~~ignored~~ unassigned.

Comment on technocratic fallacy, propensity to
play games w. techniques + hide from major issues.)

Ch. 22, Fuel Feasibility

Risk, p. 3

5. Land spec. spec. on ecog. forces -- outside the indiv. & his use plans. -- i.e. resale to another, for another use. Or hoarding for unknown self-use in distant future, -- "as an invt." Psych. escape from reality. forces he does not create or control, & cannot know as well as his own business.

Real invt. shapes 1c in specific form, so the risk is on the invt. for one's own creation, & one's own ability to make it go. One knows more what he is doing.

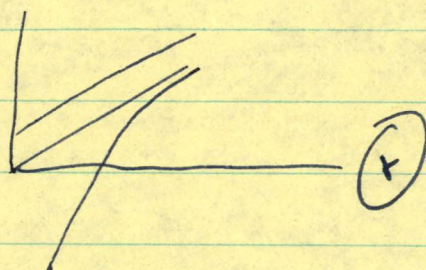
M.G., Land Spec, pp. 405-18 (w. apologies for stilted immature style)

Ec, 162 A, Thurs. 11/4/82
Risk, cont.

1. Log scales + risk analysis.

A. Log scales.

1. Abscissa is exponent.
2. Origin is $n=0, y=1$.
3. Ord. never $= 0$. y is never negative.
4. Const. growth ^{rate} is st. line. Base is $1+g$, g is % growth.
5. Parallel lines, $= g$
6. Slopes are $\propto g$
7. Const. less vertical space as go up. Shows leverage. E.g. $k((1+g)^n - 1)$

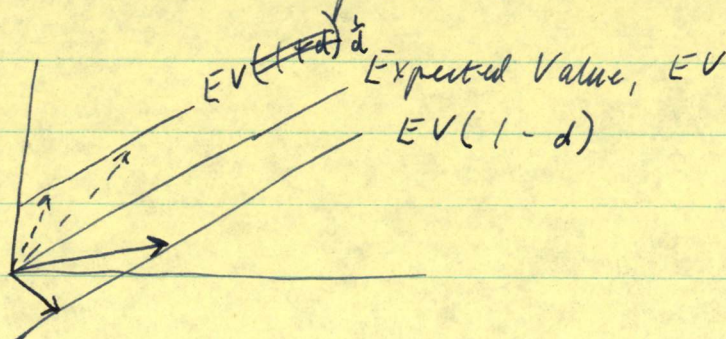


8. Reciprocals are mirror images

B. Risk

1. Do not add a risk premium to discount rate.

a.



Shows effect of a $d\%$ disappointment on rate of return.

2. Longer pds. spread the risk over more years.

3. This turns lazy mgrs. (satisficers) into long pd. investments, if they have K .

2. Load duration curves. (on separate sheet)

3. B & P's approach to risk

a. Freq. dist. of outcomes -- becomes a probability distr.,

b. Weight ea. value by its prob.; $\Sigma = \text{mean}$.

c. Dispersion around mean is also import.

Is the measure of risk.

d. To standardize σ for size, $\div \text{mean}$, = C.V.

e. But absolute σ also import, if your K is small.

f. Mean deviation just as good.

But σ is standard, hence ok to use. Calcs. make it easy.

g. % of values w/in σ

1	68
2	95.5
3	99.7

h. Problem is that prob. dist. are often skewed,
very highly -

E.g. 95% of all auto makers failed
 80% all expl. holes are dry
 90% of people have 35% the wealth
 10% have 65%

So Beware! of statistical theorists who assume normal
 curves. OK for flood probabilities; not good for investing, in
 drilling ventures; movies; growth stocks; etc.

Life is not fair. Not ruled by chance —
 less fair than dice.

4. Do people ~~seek~~^{avoid} risk, or seek it?

Insure homes, reduce risk.

Borrow on same homes & risk.

Gamble in Vegas; lotteries. Sure-fire money makers.

(Religious people gamble more)

Accept low rate on govt. bonds, bus. risk.

" even lower rate on growth stocks.

No simple answer. B + P assume avoidance is dominant, but that comes from looking at only half the evidence. (also from sneaking in a redefn. where risk is only negative, below expected value.)

Marshall on ~~game~~ the lottery principle.

Aggrg. value of spec. land holdings or e.g.
Sit on land & pray.

Still, some generalizations possible.

a. Some prefer risk, some avoid. (e.g. different gtrbacks.)

So they specialize. Some bear it for others.

Much of business contracting is a matter of assigning risks.

Will ~~be~~ return.

b. Some risk is passive, some active (or at least interactive)

Throwing dice,

Buying land -- value det. by factors outside yr. control.

God will provide

" prefer me, the Eldest

Some is Active. Driving car: You are not an active risk.

Throwing passes

Investing in med. adms.

Borrowing + building; devg. new product

Takes planning, forethought, etc. Outcome depends on you -- you guide things.

This is where you should gamble

5. Ways of coping w. risk.

A. Pooling

- Insurance. Fire; loan ins.;

Diversification of assets.

Pool demands to Δ load factors

Power lines

Central location, where many streams join.

Pool supplies from many sources

Big firms pool risks. Danger! X-subsidy, good risks carry bad.

B. Take the money + run. Let others specialize in risk.

Labr. pd. in advance

Cash rents

Fixed interest

Prop. tax

Sell land for cash, or bonus.

Long term contracts; leases.

C. Hedging (Bumonghi new job, Union Bank)

In effect, ~~sell today~~ determine today the price at which sell in future.

Fr. exchange hedge. Pesos owed in 3 mos.

D. Let others participate.

Partners, shareholders.

Land share-cropping; royalties, "partien."

Income tax

Limited partners.

Danger! Dilute incentives.

6. For risk-seekers: Leverage.

Negative partien.

Very popular.

Leverage

1. ~~Time~~ Leverage occurs whenever you get what is left over; others get fixed parts.

The residual recipient is called Equity.
Equity is at risk, or at stake.
Measure of Eq. called Pension.

2. This can occur over time

e.g. wages pd. first, then product sold.
Or can occur same time.

e.g. product sold quickly, same time as wage pd. at end of mo. Or even before.

More commonly, interest is paid as durable cap. yields cash. So the equity return is a residual, but does not necessarily come later.

3. Equity implies management. Equity int. has max. incentive: fixed costs, variable rewards.

So equity int. is the Take Charge interest.
The Entrepreneur. He has most stake in outcome.

4. Equity is leveraged by controlling a lot of fixed costs, w. a small stake of your own.

E.g. grow tomatoes, various ways, inputs of \$110

<u>Inputs with</u>	<u>Equity</u>		<u>Hired</u>		<u>Σ</u>	
	<u>I</u>	<u>II</u>	<u>I</u>	<u>II</u>	<u>I</u>	<u>II</u>
Land rent	10	0	-	10	10	10
Labor	10	0	80	90	90	90
Capl.	10	10	-	12	12	12
	30		80		110	112

I

Equity puts in 30

Rw. = 110 ± 10 , a 9% ~~±~~ half-range, or 18% range

Equity gets 30 ± 10 , a 33% 66% ..

II

Equity puts in 10

Rw. = 112 ± 10 , an 18% range

Eq. gets 12 ± 10 . Range = ~~120~~ $\frac{20}{12} = 160\%$

5. More generally: a simplified, popular perception of leverage.
 Buy for 10% down. Price rises 10%, double your stake. ‡
 $\bar{R}$ = Mean expected revenue, (= Σ normal costs of inputs)
 σ = σ of rev., (replacing the range figure used in #4).

$$\frac{\sigma}{\bar{R}} = C.V.$$

$$\text{Equity, } E = e \bar{R} \quad (e = \% \text{ of } \Sigma \text{ of costs put in by owner})$$

$$\text{Equity Risk} = \frac{\sigma}{E} = \frac{1}{e} \frac{\sigma}{\bar{R}}$$

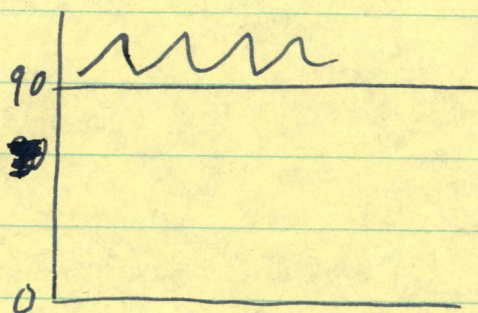
If buy for 10% down, $\frac{\sigma}{E} = \frac{1}{\frac{1}{10} \bar{R}} \frac{\sigma}{\bar{R}} = 10 \frac{\sigma}{\bar{R}}$
 If price rises 10%, you double your stake.

$$\text{Equity risk} = 10 \text{ gross risk}$$

Rule: The lower the equity share, the higher the risk.

‡ I've done that 3 times, it can be fun.

6. Same effect as cutting off the base of a graph.



Leverage accentuates the % variability
 Subtract a constant from a variable, multiply
 the % changes.

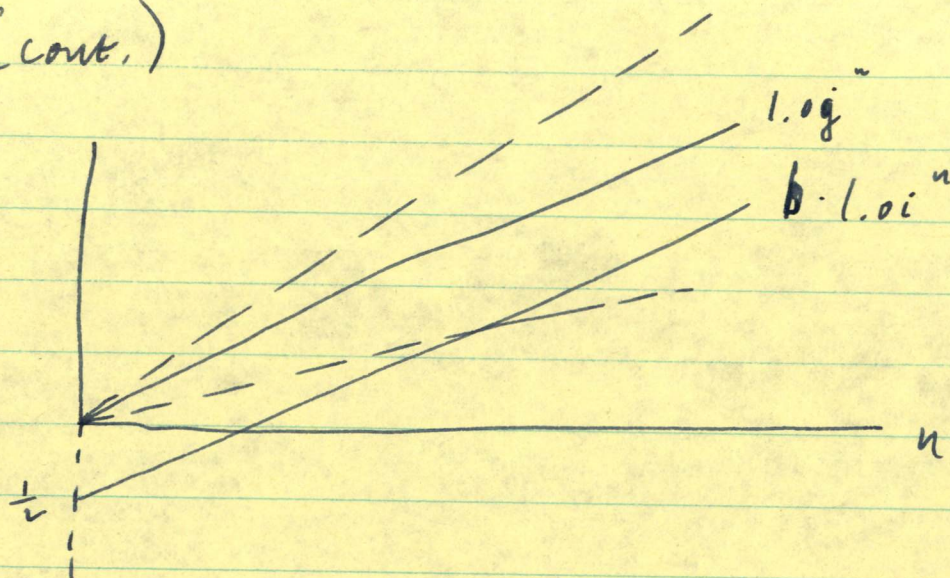
7. Equity interest is ~~residual~~ not always last to be paid, even the residual. You can live K on fixed contract, ~~just~~ by taking out a loan.

Normally, you pay interest monthly. But there are also ~~loans~~ loans where part or all the interest is deferred, until time product is sold.

Balloon
 part.

This increases the equity risk, b/c unit due to lived factor rises each year.
 Although unusual, is simpler to model, so I use this case to illustrate the point that interest adds to leverage.

7 (cont.)



If your gross rises at $i\%$, your share remains constant. Your stake has grown at $i\%$, too.

$b = \%$ of orig. inv. that is borrowed

Let g be growth of gross value,

$i =$ contract interest

Equity share is
$$\frac{1.0g^n - b \cdot 1.0i^n}{1.0g^n} = 1 - \left(\frac{1.0i}{1.0g}\right)^n \cdot b$$

The share depends on $b \left(\frac{1.0i}{1.0g}\right)^n$

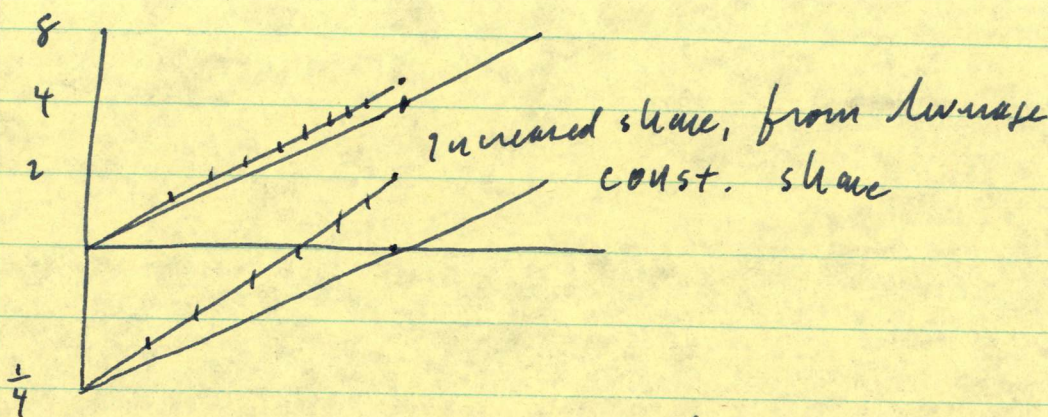
If $g = i$, ~~the~~ share remains const. $= 1 - b$

~~$(1-b) \cdot 1.0g^n = 1.0g^n - b \cdot 1.0i^n$~~

If $g > i$, equity share rises

If $g < i$, " " falls, may cross 0

As e rises, r rises.

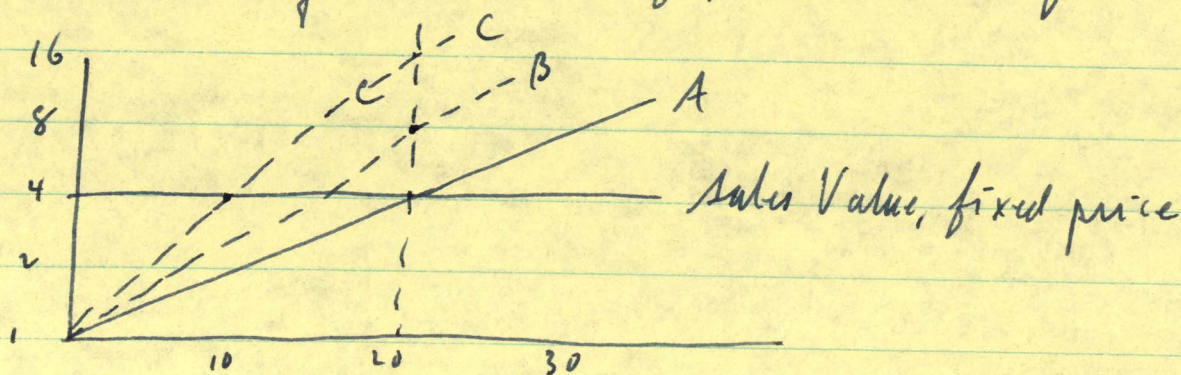


Using semi-log paper, you can do this exactly, and figure your r visually. Can also work out by algebra (p. 64, attached) for ref. only.)

8. Importance of fast sales.

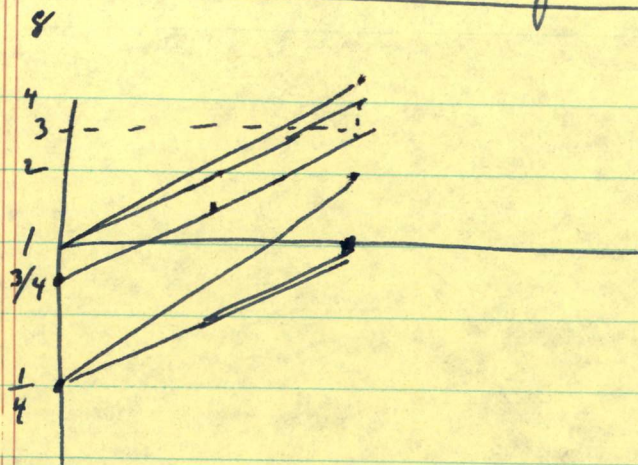
You may wonder, why bother with the slope of the line? Why not just stop by noting the change in e ?

Because rate of return depends not just on how much you sell out for, but how fast.



Cf. A, B, + C. Better to halve n than double R at $n=20$ from 7 to 8

Algebra, for ref. only.



$$\frac{(1-b)1.0r^n}{1.0g^n} = 1 - b \frac{1.0i^n}{1.0g^n}$$

$$\frac{1.0r^n}{1.0g^n} = \frac{1 - b \frac{1.0i^n}{1.0g^n}}{1-b}$$

E.g. eq. share has doubled, $\frac{1}{4}$ to $\frac{1}{2}$; in 4 yrs.
 bcs. $g = 2bq_0$

$$\left(\frac{1.0r}{1.0g}\right)^n = 2$$

$$1.0r^n = 2 \cdot 1.0g^n$$

$$1.0r = 2^{\frac{1}{4}} 1.0g \quad \text{etc.}$$

Thus, risk is not just a matter of how much you sell for, but how fast. ~~And the 2d is more important than the first.~~

9. I am actually understating this a good deal. When you add the other costs of time: land rent, storage, obsolescence, waste & decay. These act as further leverage on the return to any given investment, --- if you have to hire them for cash, i.e. (If they are your own, they dilute the leverage.)

There is no time to model all this, here & now. Just remember, maxim of Mgrs:

Move the merchandise!

Collect yr. receivables!

Turn yr. K.!

Speed is king.

Combine leverage & fast sales, prosper.
Get stuck w. unsalable stock, fail.

7. Direct risk v. Lender Risk

Collateral Basis of credit rationing.

~~8. Leverage of intensive land use.~~

Lenders have no upside risk, ~~only down~~
They have a small downside risk.

Protect selves by putting ceiling on % of a venture they will face. This is a vital aspect of a loan.

Collateral may be limited to specific venture

Non-recourse loans

Limited partnerships

Ind. mortgage bonds

Mortgages generally
Rev. bonds.

Or, backed by all assets

Bonds, ordinary

G.O. bonds

General ptors.

Money flows uphill,
Major cc. of scale.

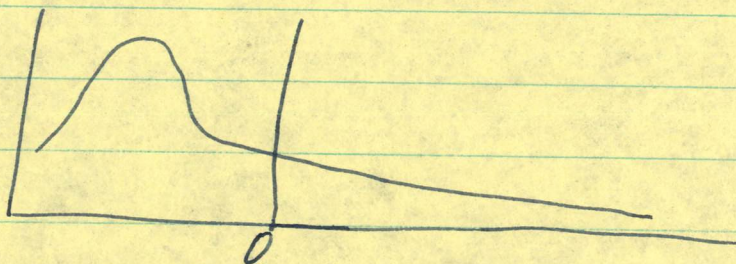
8. Who takes big risks?

a. Plungers

b. Extremely informed people.

c. Rich people.

Elephants vs. Minnows, is it explain.



You must wait for an elephant.

Cal Wro. Cities

Wro rts., pp. 24-2⁷~~8~~; 64-~~66~~ 73

Usen orgn ch. 4, Urban Dev.

pp. 21-24, Iron. & the Wro. Colonies

pp. 46-47, I. A. S.

63-64, Mistr.

State & Fed. pp. 47-57, C.V.P. & SWP

Prig ch. 8, pp. 79-85

Quality ch. 10

Syllabus Ec. 201 - 0

Major Issues, Ques., Problems + themes

1. Objectives of resource ~~dev.~~ ~~acq.~~ ~~use~~ ~~dev.~~
 acq., jobs, goods, taxes, ^{incom.} higher returns to ^{new} K. (over)
 Expansion vs. containment
2. "Full use" as a goal
 How much per site
 How much at once
 Why is full dev. a goal?
 - History of land-hogging: ^{vs. desire for widespread oppy.} ~~vs. oppo~~
 - Civic-minded yeomanry as basis of society + state
 Full use is relative to cost of labor + K.
3. Extensive vs. Intensive margins
 Decentralist bias
4. Priorities in dev. given limited capl.
 How thin to spread K? Wrt to land; also wrt labor.
5. Difference of nat. res. from K used to dev. it.
 Nature's flows are perpetual; man's flows are circulatory, ^{"shuttle"} metabolic.
6. Timing. When?
 To begin
 To add on
 To renew
 Is there an "ultimate" dev.?
7. Scale
 How much to integrate
 Time + Scale

Δ demand + oppy. for both work + savings. Job + invt. oppies.
 Δ wages + profits, also lower prices -- no dismal wage-price spiral.

Adding land Δ both wages + inqul. profits
A great secret, buried in 2-factor models.

To add more land, must $\$$ spread K equinquele.
Avoid frustration of locking up K in process of unlocking,
new lands. This has been bane of res. devmt.

"Full devmt." is dangerously diff. from "full use".
Devmt. consumes K more than labor; input more than
output; indiff. to time.

8. Flexibility, adaptability

Need:

- Frequent reinv.
- Hi ~~to~~ alt. opps. as safety net

To avoid grasping for security, paralytic rigidity, maintain. Encourage willingness to risk, to throw the dice.