Civil Servants Seminar, Old Notes

Civil Servants Seminar, May 21, 1974

1. Money makes money ...

	1
1	$1+i$
2	$1+i+i(1+i) = (1+i)(1+i) = (1+i)^2$
3	$(1+i)^2 + i(1+i)^2 = (1+i)^2(1+i) = (1+i)^3$

2. $(1+i)^n \lessapprox e^{in}$ (daily compounding)

3. If $e^{in} = 2$

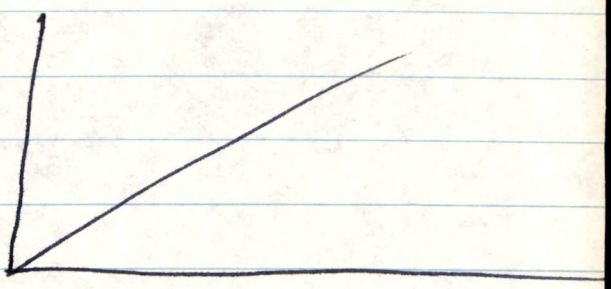
$in = \ln 2 = .70$

$n = \frac{.70}{i}$, but $\frac{72}{100\,i}$ is ok.

So money doubles every $\frac{72}{i}$ years. (for low i.)

10 yrs. at 7.2%.

n	FV
10	2
20	2^2
30	2^3
40	2^4
50	2^5



Thus, enormous power of a steady growth rate.

4. Discounting.

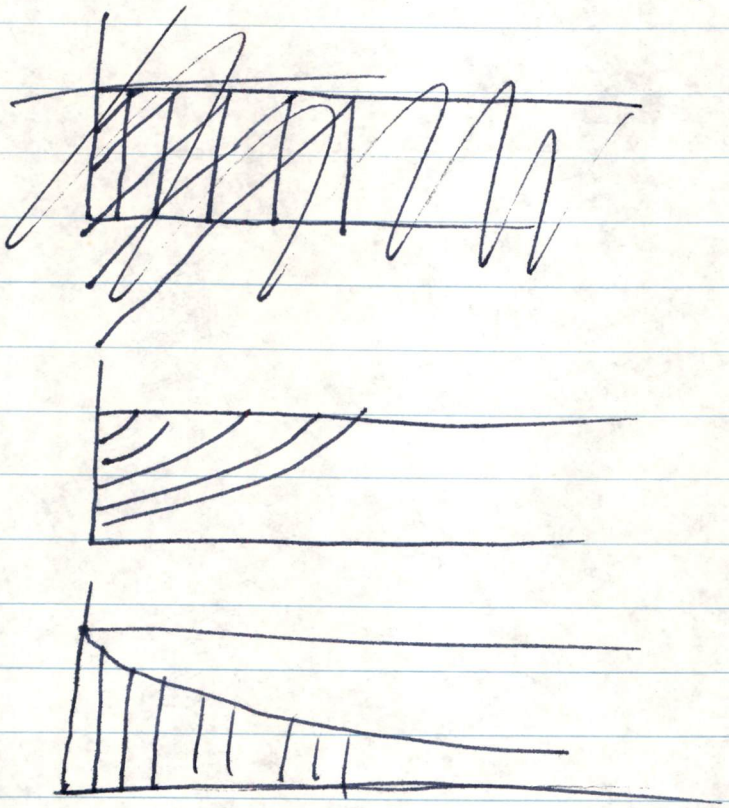
~~$1000 in 50 yrs. is worth~~

At 7.2%, in 60 yrs. 1 grows to $2^6 = 64$.

∴ 64 in 60 yrs. is worth 1.

Trade-off, rate of exchange between times.
Not sacrificing future, but reserving capl. for use that grows fastest, as Henderson shows.

5. Valuation — discounting & summing.



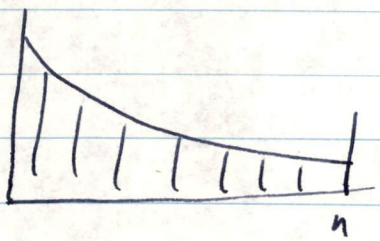
6. If land lasts forever.

$$V = \frac{a}{i}$$

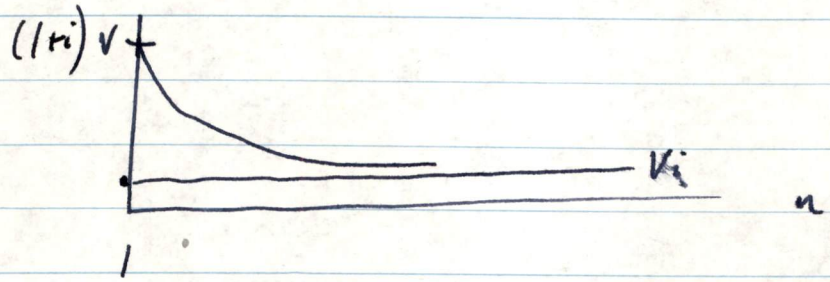
Income of putting V in bank.

7. If asset lasts finite time.

$$V = \frac{a}{i} - \frac{a}{i e^{ni}} = a\left[\frac{1}{i} - \frac{e^{-ni}}{i}\right] = a\,\frac{1 - e^{-ni}}{i}$$



8. $a = V\dfrac{i}{1 - e^{-ni}}$ Cap. recovery formula.

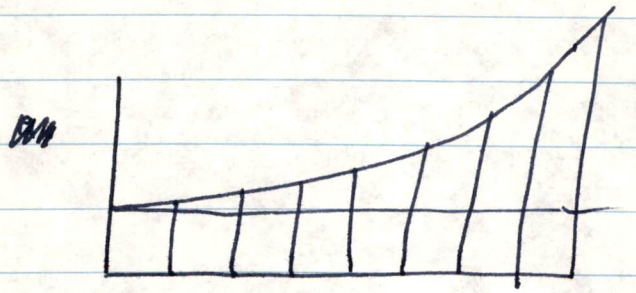


Instalment & mortgage payments

At 30 yrs. & 8%, you pay $30 \times 8.88 = 266$.

Amortizing a mill over 30 yrs. requires $8.88; over 20 yrs, $10.19, not so big a diff.

9. $FV = a\frac{1-e^{-ni}}{i} \cdot e^{ni} = a\frac{e^{ni}-1}{i}$



10. $a = FV\frac{i}{e^{ni}-1}$

Poli 2?

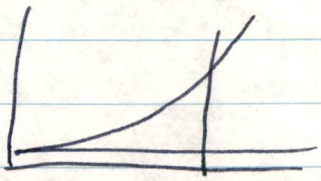
Comparing forests vs. grass.

11. ~~Normalizing~~ Factor propns.

a. If one tree,

$V = e^{ni}$

Int. is $e^{ni} - 1$.



b. If staggered forest.

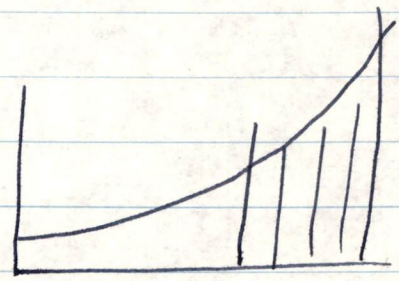
$$K = \frac{e^{ni} - 1}{i}$$

Same as #9.

$Ki = e^{ni} - 1$

Wage = 1

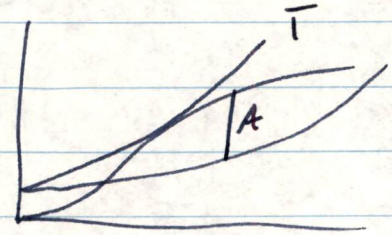
$TP = e^{ni}$



Same as before.

Shorter rotn. save capl.

12. Land inc. from forestry



$$A = g - Ce^{ni}$$

$$a = A \cdot \frac{i}{e^{ni} - 1} = \frac{g - Ce^{ni}}{e^{ni} - 1} \cdot i$$ Faustmann

Max a. g' = growth rate of T

$$T = Ce^{ni} + a\frac{e^{ni} - 1}{i}$$

$$T' = i\left[Ce^{ni} + a\frac{e^{ni} - 1}{i}\right] + a$$

Rationale of the Market.

May 1, 1974

Seminar. not course – you can talk back

1. Aspects of ec. and. often misunderstood

a. Ecs. is mechanical & overlooks human factors.

Ans: Cons, sovereignty. Man the measure. Demand. And ecs. also inquires into how people get their money. (Which is why they respect demand more than "needs".

b. Ecs. is a "factor", and overlooks "non-ec. factors."

Ans: all disciplines comprehend the universe in their own terms. They differ in the aspect of things they measure.

A drop of water. Chemist; physicist; biologist.

Ecst. measures it by what it is worth to people. Thus is a very human discipline.

Is an arbitrator. You name it. & I can find 20 people who want the govt. to subsidize it. How cf. incommensurables? By what they are worth to people.

c. Human interests are non-measurable.

Ans: Value in exchange, or trade-offs. Every one is a measure. Millions take place daily.

Any one item of the millions traded would do as a yardstick. The $ is good – but maybe replaced some day.

d. "Ec." behavior is chasing the $: pecuniary & materialistic.

Ans: A. Smith founded ecs. by pointing out this is false. Real goods count. & the real satisfactions from them

re gold

— not the material. ~~The most economic~~

E.g. air pollu. people contract human damage & ec. damage. Direct damage to humans is the most ec. of all.

Ecsts. differ only in preferring to let indivds. put their own value on damage, rather than chemists or moralists.

Q. Smith noted people work for less $ if they like the work. That is ec. behavior (but some ecsts. forget it)

e. Ecsts. lack respect for human life.

Ans: Ecsts. rather observe that people do. To some degree, they must.

E.g. auto travel.

E.g. human cost of bldg. flood control dams.

E.g. smoking

Infinite values are not comparable; they only break the scale

f. Ecs. wd. lead to extreme & unacceptable radical changes.

Ans: Ec. policies are non-catastrophic, gradualistic, equilibrating. E.g. effluent charge.

E.g. higher prices; flexible prices to substit. for enormous excess capacity (peakload pricing).

g. Ecsts. ~~define~~ "effic." wd. throw many out of work. True of some bad ecsts.

h. Ecs. only deals w. mkt. commodities.
There is that danger. Heller as idolater of GNP.
But whole branch of ecsts. deals w. valuing parks, fisheries, highways, etc.
Knetsch.
And advising public lands.

i. Ecs. is for pvt. businessmen & households only.
Ans: ecs. concerns making best use of resources. Efficiency in govt. involves mobilizing & deploying res to meet com. demands.

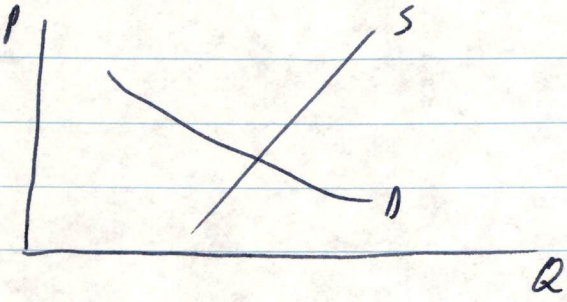
It is an alternative to other ways of making decisions,

- logrolling
- management aggrandizement (Stockfisch evening)
- profnl. standards, regardless of cost
- mutual backscratching

As such it can be a threat. Hope the benefits are worth it.

2. Price system, S & D.

a.



A simple theory to conjure with.

b. Surpluses & shortages.

c. Supply cost is value of other things, thus reps. other demands.

Thus the whole system fits together. Resources allocated equimarginally. No shift wd. do any good.

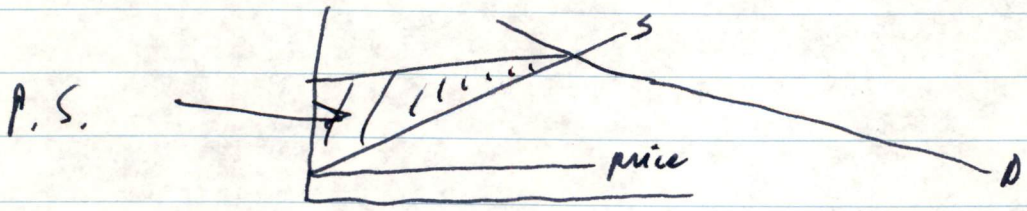
Invisible hand.

d. Equilibrating tendency of flexible prices.
Nonsense of overreactive feedback (Ehrlich, e.g.)

e. Dual fn. of prices
Ration supply
Evoke "

f. Why mkt. clearing price is best. There are many alternatives.

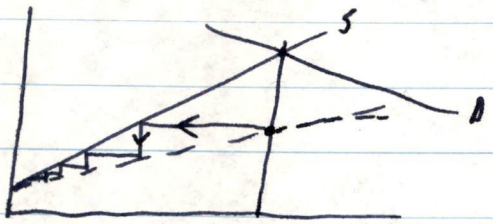
1. David Schwartz. Why must there be any rent?



Even this price wd. only eliminate rent due to this mkt.] There might still be rent from other uses. or producer surplus.

2. Indy ave. costs

A.

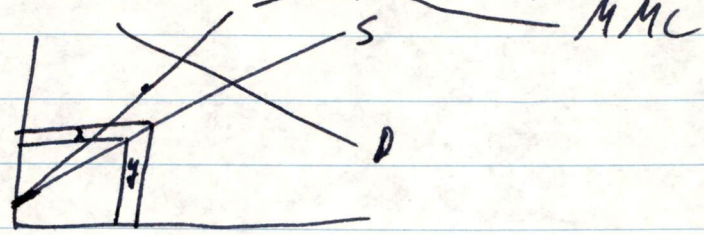


B. Or, include full land cost, all pr. surplus imputed away.

Circular, bcs. price now determines cost.

C. Or, include land & capl. at historical cost. "Chronological ingulum."
Purely arbitrary. Ecs. cost means current opp. cost.
If Historic costs are low, you then waste that resource.

D ~~A~~. Or, cost to buyers mnpg, where price is flexible.



$$MMC = SP + \frac{SP}{e}$$

$$\text{Less. } e = \frac{\Delta 1/Q}{\Delta P/P} = \frac{P}{Q \cdot \Delta P}$$

$$\frac{SP}{SP/Q \cdot \Delta P} = Q \cdot \Delta P$$

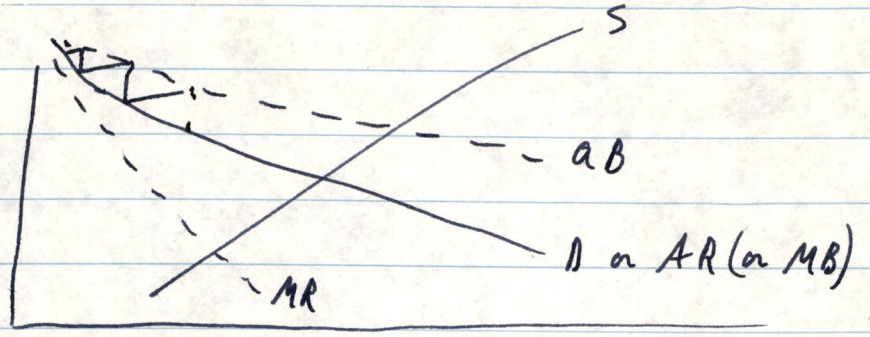
Gives too low a price & Q.

E. Split supply, like water in S. Calif. Local low cost water wanted — so you must import clean water.

3. Price control justified if buyer has a mnpy.
Min. price control,
This also prevents him from discriminating.

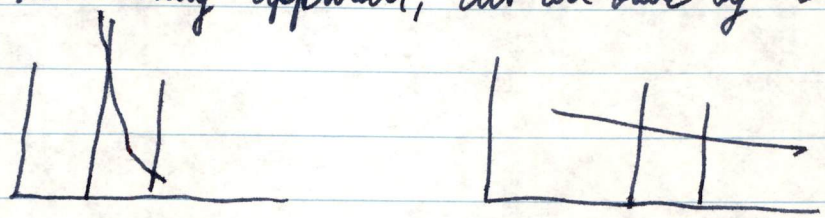
So price control not always bad

4.



g. The requirements or needs approach. very common, ignores elast. of demand, fn. of price to ration supply.

h. Prorationing approach, cut all back by 25%.



Re elim. set.

1. Total, ave, mgnl. MP = MC
   Most eff. combo., maxes. only bottom line. Optimizes. Depends on price.
2. Stages

3. How you get to Stage III

   a. Free entry. i. overlooking decline of AP of intra mgnls. e.g. cattle
   b. Rights of use ii. symmetry. adding land to a city, overlooking spreading out of use of s.o.c., etc.
   c. Limited demand. MC < AC?

4. Inverse relation of MPs.
   The fishery fallacy - ltr. to E. Fox
   The small farm fallacy (Paglin, Berry, etc.)
   Fallacy of "low quality profits"

4A. Symmetry of law.

5. Max B/C ratio, n.g.

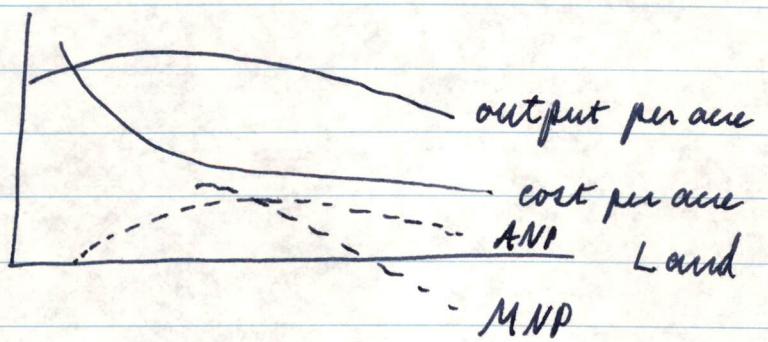
6. "Efficiency", "productivity": single factor eff. ng.

7. Exhausts TP. Use "The 11th acre" demonstration.

8. Equimgnl. allocn.
   Fallacy of prorationing.

9. MP & MRP & AP — why MP is normative

10. Eco. of scale.
"Spreading overhead" — easy to get carried away.
E.g. of large mills over timber reserves.



Watch that mgnl. bottom line.

Disec. of Scale.

A. Large machines
   1. Xptn cost

   2. Δ weight > Δ strength

   3. Slower. Ponderous, cumbersome. Dinosaur.

   4. Less maneuverable. Low bridges etc.

   5. Longer to build, & depreciate, in fickle mkts.

   6.

B. General

   1. Adm. bottleneck – so overcentralize, red tape, or lose control
      Breech. Ford studies
   2. Lose incentive – salaried employees
      To produce
      To innovate

   3. Cost of watching, contriving incentives, etc
      Expensive top mgrs – bottleneck.
   4. Corruption, other peoples' money.

   5.

Carry to extreme, get Soviet Russia. GM = Yugoslavia.

alternative ways of tying ec. together, coord's human activity –
conscious vs. unconscious.

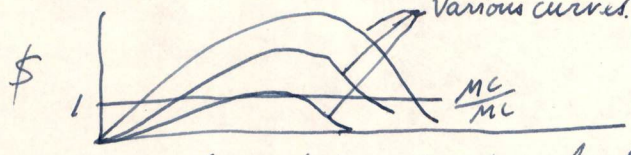
To handle many inputs: Students can get this

Take MP per $ of cost.

Can take something as fixed if wish. In fact, is better to. Otherwise, nec. get MP = AP at 1, becomes truism, w/o any residual.

The "fixed" thing can then be varied on a 3d dim., to max. it.

Take land as fixed.



Various curves for various acreages. Take best. These cd. be put on 3d dim., take max. maximorum.

(N.B., this is just as valid as taking small no.s of men. In neither case do you actually do it, but just consider plans.)

Vary land, until get max. resid. Note this is where residual stops rising, starts falling — i.e., is where MP land = ANP, or MP of land x no. of acres = residual, So $\Sigma MP = TP$

Here we are handling all variables.

Note we are maximizing something: ANP of land. In 2 dimensions, --- i.e. x & z, max. maximorum.

Tues. May 14, 1974

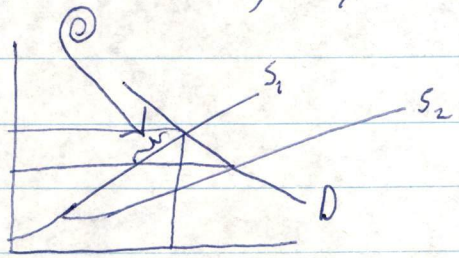
A. Loose ends (12 pp., 16 points!)

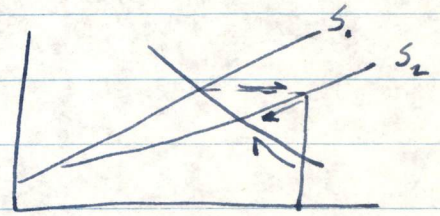
✓ 1. Importance of price flexibility, as S & D shift
Subst. for excess capacity, when capl. is scarce.

✓ 2. Price is not determined by cost.
Costs, effluent charges, royalties, taxes, etc. are not automatically shifted forward.

✓ 3. Equilibrating tendency
a. Fallacy of Ehrlich, in Eco catastrophe - ~~fallacy of~~ breaking malignant chain reactions, where a lesser effect of a cause is magnified into the main effect. (If Ehrlich's biology is like his economics, it, too is wrongly catastrophic.)

fallacy of forces overcome & and reversed by their own effects
primary effects reversed by 2dary effects
which tempers the major effect,





Effect of new supply, $S_2 - S_1$.
Price drops, driving out mgnl. supply on S_1, (arrow)
Ehrlich has this then drive out all of new supply, plus much of old, result in higher price, permanently. [Fallacy is same as confusing a shift along the S curve, due to lower price, from a shift of the S curve. The initial increase (over)

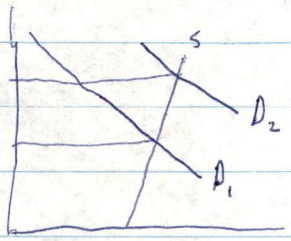
b. Other examples of like kind. (overpowering feedback!)
Deeply pessimistic views of world, probably have roots in psychology of writer and can't be ~~easily~~ assuaged by mere reason. Like a powerful father who overreacted and put down the boy whenever he did anything positive.)
(also have roots in not understanding simul. eqns.)

of supply shifted the curve. This caused a lower price, which causes a shift back along the new S_2 curve.] [Necessarily to an eq. Q that is larger than original Q.]

Thus the fallacy is to let a shift along a function outweigh a shift of the function.

i. If demand increases, that raises price and drives out marg. old buyers. Fallacy: to conclude that no one can use the resource any more; & that there is less of it.

E.g., urban land. ↑ demand raises price, drives out lower users. They say, no one can afford to live there, high rents are driving people away. But they're only driving away marg. users, in order to save land for higher users.



E.g., history of slaves. High demand from west raised price, drove out marg. eastern demand. Some looked w. blinders or a microscope at these marg. easterners, said slavery was dieing.

Skip

ii. Reversing effects of taxes.

E.g., income tax ~~favors~~ is easier on capl.-intensive indy. than labor-int. indy. Thus, it chases capl. out of labor-int. indy — & into capl. intensive. Thus, ↑s supply of capl.-int. goods, lowers their price. The lower price tempers, moderates, & limits the effect. If it weren't for this, small causes would have infinite effects.

Fallacy now is to say the lower price would reverse the cause and drive capl. into labor-intensive indy.

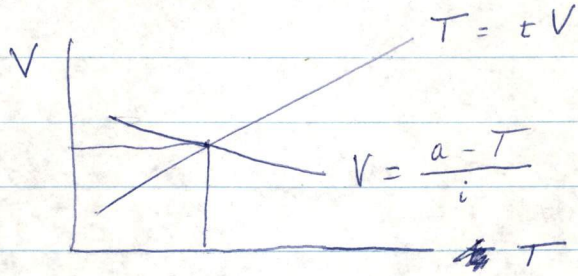
Fallacy is to have, moderating, reactive equilibrating effect ~~(lower price)~~ (lower price) overcome its own causes (lower cost & larger supply)

Analogy: you raise thermostat, heat rises, this shuts off furnace, and you conclude that raising thermostat lowers the temp.

Analogy: you accelerate car, this Δs friction & wind-resistance, causes you to go slower. Fallacy of forces reversed by their own effects.

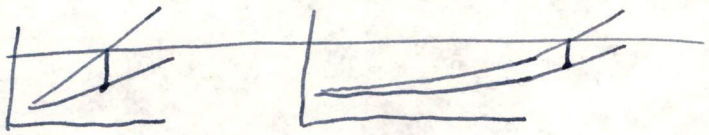
(do not use) c. Re tax expn. formula, $V = \frac{a - tV}{i}$

Tax lowers base, thus lowers tax levy, thus increases base, so $\Delta t \rightarrow \Delta V$.



$$V = \frac{a - T}{i}$$

$$T = tV$$



4. Chronological regulsm. (or historical-cost pricing)
Paying high price for "new gas; low for old.
Analyze more. What does it imply & achieve?
(a form of imperfect. price discrim.)

a. High-grading old deposits, bcs. of low price. I.e., partially kills fn. of price to evoke supply.

b. Underpricing old gas for consumers, so they waste it. All resources shd. be priced at same level as highest cost, so price can serve its 2d fn. of rationing supply. Sometimes mix old & new, overstimulate demand overall, price below regul. supply price, P=AC

c. Partly confiscates sunk capl. of producers of old. Severe notice on producers of new that they will be treated the same in future.

d. Keeping old gas partly off mkt, price umbrella effect, premature use of new gas.

Skip | "Old gas" may have been regul., but entail much sunk capl.

The high cost & low cost parts of supply can have been begun at same time.

Often, the old gas is high cost in s.r. because the old plant is depred. & obsolete. This is more true of power plants, etc, where capl., rather than the resource, is biggest input. But old gas can be regul. now bcs. of partial exhaustion, too. And the exhaustion can be ~~that~~ related to sunk plant — i.e. the gas well is obsolete relative to where the remaining gas is now, etc. Maybe too shallow, or off to one side.

(4) is

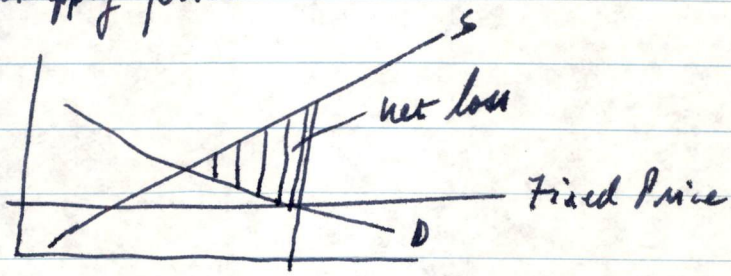
✓ (5.) Related to chrono. regulam. is concept of rent as "windfall" due to higher price.

There is rent at every price.

✓ (6.) Demand curve shows error in engineering "needs" or "requirements" approach.

E.g. re supply of hydro; or water; or highways.

Underpricing results in consuming large Q, of high marg. supply price.



(Net loss is even greater when there are external costs, too, as w. hydro reservoirs, highways.)

(W. highways, underpricing results in more traffic inside given perimeter, and add cost of widening highways. But its even costlier when this leads to lengthening highways. Lengthening results from a different kind of underuse, underuse of land served by highways.)

7. Supply curves and historical costs, & opp. costs

Short run supply response is inelastic, because of sunk costs.

There are also ~~[illegible]~~ irreversibilities.

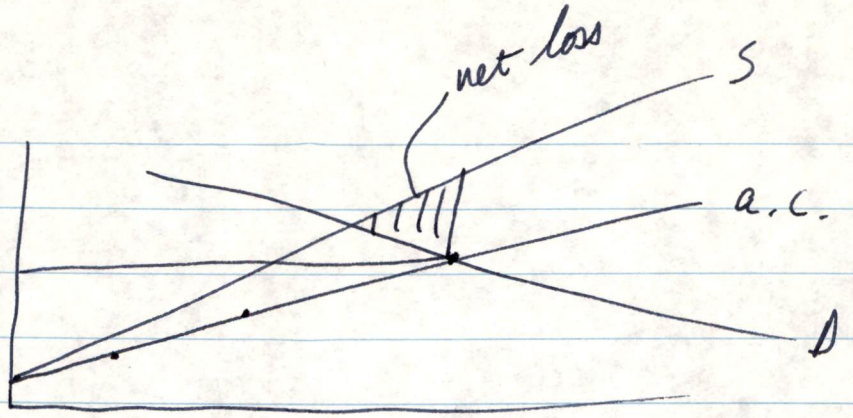
So the curve does not tell us mechanically what response to expect from changing prices. There are lags.

But here we are just introducing subject, so look at curve under easiest assumptions — easy in-&-out by all resources, or at least quick in-&-out.

So S curve is based on o.c., & s.r. o.c. = l.r. o.c.

✓ (8.) Re pricing a whole indy. at its a.c., my model probably embodied a wrong assmn. that the whole indy. wd. receive this low price, and thus we wd. undersupply the mkt.

More common is ~~the reverse~~ that the consolidated accts. pool profits, and the high cost marg. opns. are kept going by subsidy. And the lower price increases demand still more, justifying even higher-cost opns. This dissipates producer surplus.



[a.c. pricing thus stimulates too much in Δ_S cost aspect of things, e.g. subsurface reserve extensions; and too little in deep cost aspect, like Δ_S capacity.]

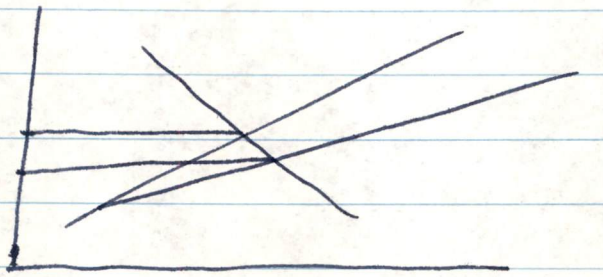
LNG case. Pool in LNG at $1.20/mcf, and sell to consumer at 40¢.

a.c. pricing also fails to capture ec. rent entirely? No, since $aC = aR$, it's all taken from producers. Much is transferred to c.s. – & much is dissipated.

9. A supply curve relates to resources ~~in our industry~~ producing a commodity, & not the fncl. position of ~~a~~ the firm.

Thus a firm w. heavy debt & no equity has higher explicit costs than another with no debt. But a comp. return on equity is an imputed cost, and that is counted. The indebted firm might be foreclosed if prices fall, but still produce the commodity.

✓ (10.) The man or group who invades a mkt. and takes customers from his colleagues is not anti-social. He ~~hurts~~ helps more than he hurts.



✓ (11.) A monopoly seller tries to divide the mkt., to expand output & capture mgnl. buyers w/o lowering price to other buyers.

This explains dumping, sales, discounts, bazaar pricing, etc.

It also explains equal rates or prices for different costs of service.

It does not explain peak load pricing, which results from rise of demand curve.

✓ (12) Demand measures the social value of product. If demand fails to cover costs, is a sign you shouldn't do it.

~~Also~~ If costs rise for some special reason, e.g. risk (or due to anything) due to unstable demand, that too is a sign you should produce less — maybe even none.

Also if costs rise due to location of consumer. Or due to unusually heavy use of capital, like forestry or p.w. or housing.

✓ (13) Fallacy that traffickers or speculators make prices rise. ✓

S & D make them rise. Trafficking ~~does~~ merely punctuates & measures the rise. Spec. goes along for the ride.

E.g. people who sell farm mktg. quotas — do not make them rise, they merely bring it to our attn.

✓ (14) Fallacy of not recognizing the o.c. in producer surplus.

The resource, usually land, that lets you earn a surplus has an ~~o.c.~~ imputed value & cost — not in other use, but its capacity to produce in this, its best use.

This should be economized on, i.e. used.

But in cartel schemes, the high cost end of the

supply curve often gets equal or better treatment.

By prorate.

Or by sliding scale prorate where high cost producers — e.g. deep wells, stripper wells — get to produce at higher % of their capacity. The thought behind this is that the o.c. of land is not a cost. (Is also a form of price discrim.)

This is akin to the favored bias given to unpd. land in some other regards:

If everyone pays mkt. for his land then all have same costs (including xpts. to mkt.)
and B.C. Gas Mktg. Board

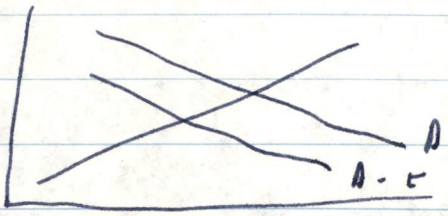
FPC is a kind of monopsony which discrimns. among sellers. Lower price paid to those who will produce some for a lower price, bcs. of sunk costs, or good land, or both. Thus, lose unpd. trade of those getting the lower price; — i.e. they high-grade their land — and motivate them to seek other outlets, e.g. as U.S. gas

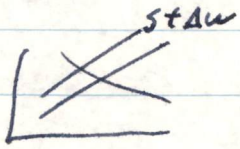
producers now sell intra state.

Thus, discriminator loses cream of mkt. to others

15. If demand curve rises, price rises, and buyers will now get more use out of each unit. This makes demand curves elastic.

✓ (16.) Tax shifting. – not all taxes are shifted.



Not all wage Δs are shifted: non effluent changes. 

17. The further you are from MC = P (= MB), the greater the gains of thrusting that way.

18. Prices not det. by cost. Part of cost is det. by price.

19. Rising S curve means you charge everyone the same high price needed to cover high marg. cost.

This might seem to ~~do~~ mean you charge early buyers more than ~~their~~ the MC needed to serve them. But that's OK — correct price is MC of last buyer.

(Even justifies pricing TV?)

20. Are demand & supply elastic to price?

Generally yes, very. Scarcity breeds substs.

Reversal of position by farm spokesmen

Fearing glut, opposed lowering price, bec. demand inelastic.

But in scarcity favor raising price, to make food go further, stop waste.

Underpriced energy, led to fantastic Δ demand.

Devaluation. It always works, to Δ experts & reduce imports. But there are always many false prophets who say it won't, who foresee vicious spiral of doom.