

R77-77: Ref. of land & rent

Instead of "xfr rent" ?
shd. have chosen "producer
surplus".

Land, bes perpetual, slow
change of instns.

Instns centered around products
tend disappear w. products. Those
around land endure.

(Hence greater interest of historians
in land, e.g.)

Static elements in society rally
around land, $\therefore$

Cap. turns over. Each time,
changes form, or at least may
do so. Remarkably adaptable,
changes to meet needs.

Labour savg. land savg.; long term,
short. Complete metamorphosis.

Land never turns over. Only
mobile in that may change
use. ~~That~~ Largely, keeps same
role --- continues to complement,
to compete, as before.

a quality of land:

Highly comply to labor & cap; always more comply than subst. (except in sense of land mkt, where all are by def. substs)

✓ But land is least comply to input. Makes least demands on input. Hence its ~~appeal~~ attractiveness for absentee investors, etc.

MP of land differs in that
not homogen., re location.

So megal unit is not fungible,
is a specific acre.

Land's spatial immobility
esp. important re pol. jurisdictions
These are defined, indeed, in terms
of land. Cap. flees overseas
land stays put.

To say land differs is not to be blind
to substn. possibilities, nor need to
dev. new land.

But is to open eyes to new
possibilities.

Is a human sacrifice in creating cap., shown by i.r. > 0. And it is
land that keeps i.r. > 0 !!!

List the formidable no. of leading econs who have insisted that land has unique qualities, esply suitable for taxation.

Seligman

Hotelling p. 256, Genl Welfare etc.

A. Smith etc. - see Rating of Site Values.

Marshall

Pigou

Ricardo

Mill

Tse

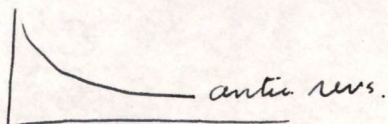
Brown

Heller

Wald?

This might come in intro. when defining land & answering "why".

Malthusian basis for
distinguishing land from
cap.



Not only do durable goods yield less net rev. in later yrs, but this is smaller % of gross, since maintenance costs etc. are subbed for cap. costs. This further reduces interest-elasticity of demand for non-perpetuities.

Maybe an entering wedge.

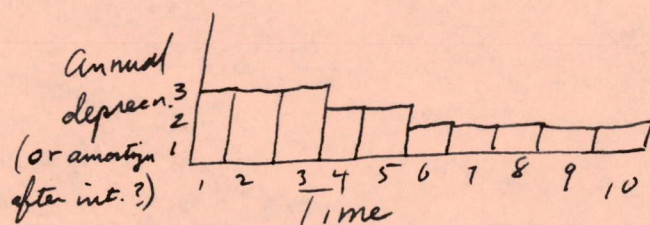
"Turnover" needn't be restricted to inventories. The capital of all ~~the~~ firms has a rate of turnover. One est. is cap. of electric utilities turns over once in 5 yrs or less!!

I suppose cap. turns over when ~~the~~ value falls to $\frac{1}{2}$, in genl. Recouped half is now reinvested, is assumption. No, faster!

I needn't speak of how cap. "turns over & depreciates".

It all turns over.

Ave. ^{time-}rate of turnover of capl is the mean of the periods for which each \$ was sunk, unrecovered. Since deprecn is higher in earlier yrs this is genlly $< \frac{1}{2}$ total life.



No. of \$	Period sunk \$-years
3	1
3	2
3	3
2	4
2	5
1	6
1	7
1	8
1	9
1	10
$\Sigma \$$ 18	$\Sigma \$\text{yrs}$ 76

$$\text{Ave pd. invested} = \frac{76}{18} = 4.2$$

Rate of turnover is same as $\frac{\text{annual sales}}{\text{capital assets}}$?

Yes, if the cap. assets are maintained thruout the period by reinvestment, as a gross inventory. But if were selling out, turnover wd. be 2x as fast, if finish sellout at yr. end. Bus. have had only $\frac{1}{2}$ as much cap. sunk, on ave.

Critics speak of old bldgs as tho their entire cap. had life span of whole bldg. Perhaps by false analogy to inventory which is maintained.

But take a going concern that maintains its bldgs, or replaces, $\left[\text{annual sales less } \begin{smallmatrix} \text{value added} \\ \text{(net income)} \end{smallmatrix} \right] \div \text{value of assets} = \text{rate of turnover.}$

If we are to believe the reports of large corps, their gross sales are much larger than their net incomes. But this is partly labor cost, & that wd. be part of net inc. in sense used above. But may have to split that, bcs employer sinks cap. into product until it is sold

But take total retail sales, they are somewhat less than N.? but more than cap. in retail facilities & inventories. As we carry it back further we add sales at wholesale, & capl. in wholesaling, for a more comprehensive figure. (We must also value inventories at sales value & sales at same; or both at purchase value - to avoid -4g turnover rate by vertical intr. Does it suffice?)

Anyway, merchants turn over their inventories several times a yr —
 check R. Faulke's cap. ratios. And mfrs somewhat slower, perhaps.
 Firms slower yet. ^{Tree farms} ~~Farmers~~ holders still slower. Landlords never.

Let $V_i \equiv$ value in

$V_o \equiv$ value out

$F \equiv$ fixed invt.

$$\text{Turnover}_a \equiv \frac{\sum V_o}{\text{Mean } V_o + F} \quad \dots \text{more comprehensive, bcs includes cap. sunk in ops on site or w-in firm.}$$

$$\text{Turnover}_b \equiv \frac{\sum V_i}{\text{Mean } V_i} \quad \dots \sum V_i = \sum V_o - \sum Y$$

$$T_b = \frac{\sum V_o - \sum Y}{\text{Mean } V_i + F} = \frac{\sum V_o - T(V_o - V_i)}{\bar{V}_i + F}$$

$$\text{But } \bar{V}_i = \bar{V}_o - Y + F$$

$$\text{Not } \bar{V}_i = \bar{V}_o - Y + F$$

$$(V_o - V_i) T = \sum Y$$

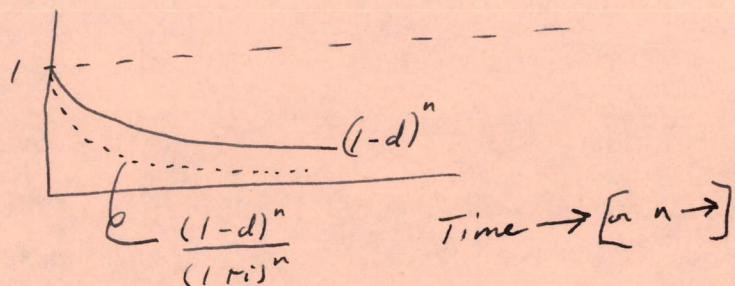
$$V_i = \frac{\sum Y}{T} - V_o$$

etc. — too tangential to pursue now.

Now summarize up to here. Algebra largely

66

I proposed to set up a typical function of decay of ~~value~~, annual revs, discounted, to show effects of changing i.r. on values of typical durable assets.



$$\Sigma = a \frac{1-r^n}{1-r}$$

I learned some expressions can be (& usually are)

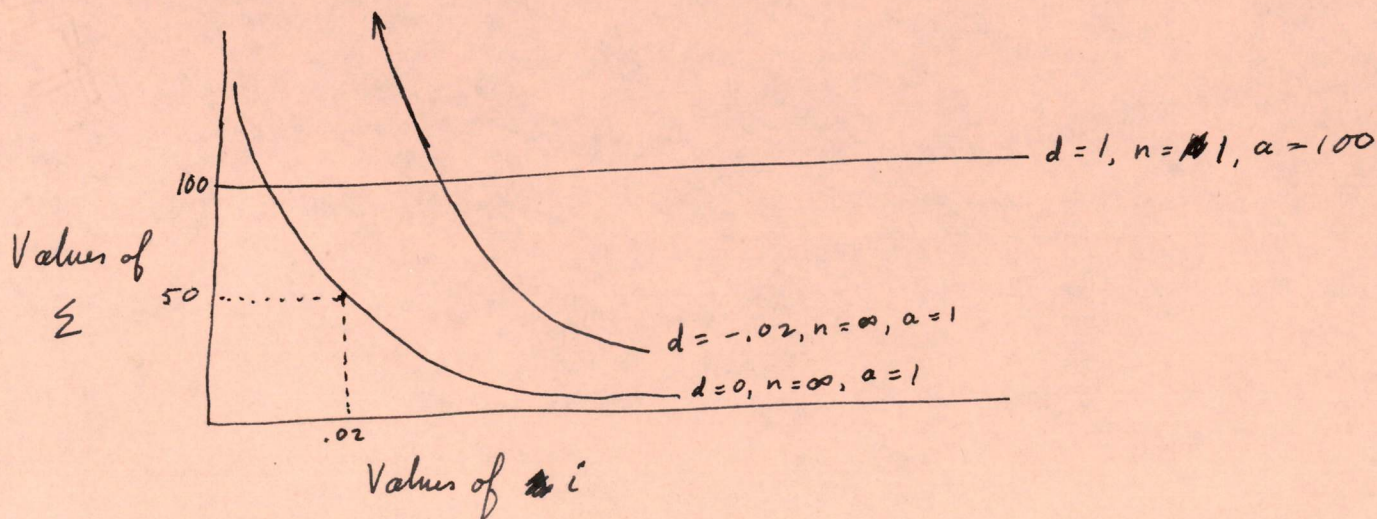
simplified by dropping first term and adding a last, ar^n

same as multiplying by r : $\Sigma = ar \frac{1-r^n}{1-r} = a \frac{1-r^n}{1-r} - a + ar^n$

I learned $1-d \cong (1+d)^{-1}$ and they are close to interchangeable.

Let $r = \frac{1-d}{1+i}$. Work out numerical e.g. w. $n = 10, 20, 40$, etc.

$$\Sigma = \frac{1+i}{i+d} \frac{1-(1-d)^n(1+i)^{-n}}$$



$$\begin{aligned}
 .9^2 &= .81 \\
 .9^4 &= .6561 \\
 .9^8 &= 4304672 \\
 .9^{16} &= .1853018
 \end{aligned}$$

$$.9091^2 = .82646$$

$$.9091^4 = .683036$$

$$.9091^8 = .466538$$

$$.9091^{16} = .2176577$$

So even when you get to 16th power difference is slight.

What are differences between $r = (1-d)$ and $r = (1+d)^{-1}$?

$$(a) \quad \sum = \cancel{1} + (1-d) + (1-d)^2 + \dots + (1-d)^{n-1} = \frac{1 - (1-d)^n}{1 - 1+d} = \frac{1 - (1-d)^n}{d}$$

$$(b) \quad \sum = 1 + (1+d)^{-1} + (1+d)^{-2} + \dots + (1+d)^{-(n-1)} = \frac{1 - (1+d)^{-n}}{1+d - 1}$$

$$= \frac{1+d - (1+d)^{-n}}{d}$$

Let $n=2$

$$\sum (a) = \frac{1 - [1 - 2d + d^2]}{d} = \frac{2d - d^2}{d} = 2 - d$$

$$\sum (b) = \frac{1+d - \frac{1}{1+d}}{d} = \frac{1+2d+d^2-1}{d(1+d)} = \frac{2d+d^2}{d(1+d)} = \frac{2+d}{1+d}$$

Let $d = .05$

$$2 - d = 1.95$$

$$\frac{2+d}{1+d} = \frac{2.05}{1.05} = 1.952381 > 1.95$$

So when $r = 1-d$, series decays just a trifle faster, and sum grows a hair slower, than when $r = (1+d)^{-1}$

Let $d = .10$.

$$1 - d = .90$$

$$(1+d)^{-1} = \frac{1}{1.1} = .909090\dots > .90$$

Now if we raise this to 20th power, how much diff. makes?

$$V = \sum = \frac{(1+i) \left[1 - (1+i)^{-n} (1-d)^n \right]}{i+d} = \frac{1+i - (1+i)^{-n} (1-d)^n}{i+d}$$

$$\frac{dV}{di} = \frac{(i+d) \frac{d}{di} [\text{num.}] - \text{num.} \frac{d}{di} [i+d]}{(i+d)^2} = \frac{(i+d) - (1+i)^{-n} (1-d)^n (1-n)(1+i)^{-n} - \text{num.}}{(i+d)^2}$$

$$\frac{d}{di} \text{num.} = 0 + 1 - \left[(1-d)^n \frac{d}{di} (1+i)^{-n} \right] = 1 - (1-d)^n (1-n)(1+i)^{-n}$$

$$\frac{d}{di} (1+i)^{-n} = (1-n)(1+i)^{-n-1} = (1-n)(1+i)^{-n}$$

$$\frac{dV}{di} = \frac{i+d - 1 - i + (1+i)^{-n} (1-d)^n - (i+d)(1-d)^n (1-n)(1+i)^{-n}}{(i+d)^2}$$

Now you is, how is $\frac{dV}{di}$ affected by d ? i.e. what is $\frac{d}{dd} \frac{dV}{di}$?

$$\frac{d}{dd} \frac{dV}{di} = \frac{(i+d)^2 \frac{d}{dd} \text{num.} - \text{num.} \frac{d}{dd} [(i+d)^2]}{(i+d)^{2 \times 2}}$$

$$\frac{d}{dd} \text{num.} = 1 + (1+i)^{-n} n (1-d)^{n-1} (-1) - (1-n)(1+i)^{-n} \left[(i+d) n (1-d)^{n-1} (-1) + (1-d)^n \right]$$

$$\frac{d}{dd} (i+d)^2 = 2(i+d)$$

$$\frac{d}{dd} \frac{dV}{di} = (i+d)^2 \text{ etc. ... Is this really a simpler way to make the point?}$$

If $d=0$, $\Sigma = \frac{1 - (1+i)^{-n}}{i}$, ok.

If $d=1$, $\Sigma = 0$, (since first term is $ar = a \frac{1-d}{1+i} = a \frac{0}{1+i}$)

But this is absurd, & comes only from skipping the first term.

If you use this expression, then, break into small units when get to $d \rightarrow 1$, say tenths of a year.

And since we don't seem to have simplified any anyway, why not include first term?

$$\Sigma = \frac{1-r^n}{1-r} = \frac{1 - (1-d)^n (1+i)^{-n}}{\frac{i+d}{i+1}} = \frac{1+i - (1-d)^n (1+i)^{1-n}}{i+d}$$

$$= \frac{(1+i)}{i+d} \frac{1 - (1-d)^n (1+i)^{1-n}}{\cancel{i+1}}$$

Now:

If $d=0$, $\Sigma = \frac{1+i - (1+i)^{1-n}}{i} = (1+i) \frac{1 - (1+i)^{-n}}{i}$

If $d=1$, $\Sigma = 1$ (or "a") NB i.r. has no effect.

If $d=-i$ $\Sigma = \frac{0}{0}$, use l'Hospital's rule. But can predict

result: ~~$\Sigma = \frac{1+i}{i+1}$~~ But $\Sigma = 1 + r + r^2 + \dots + r^{n-1}$

$$\Sigma = 1 + n - 1 = n$$

$r = \frac{1-d}{1+i} = \frac{1+i}{1+i} = 1$. So $\Sigma = n$. This doesn't

mean i has no influence, on contrary, $\frac{d\Sigma}{di} = f\left(\frac{1}{d}\right)$

in ~~CHAMPA~~ ~~CHAMPA~~

$$\sum = a_1 + a_2 r + a_3 r^2 + \dots + a_n r^{n-1} = a \frac{1 - r^n}{1 - r}$$

Actually $a_n + a_{n-1} r$ etc.

Let $a=1$

$$r = 1+i$$

$$\text{Then } \sum = \frac{1 - (1+i)^n}{1 - 1-i} = \frac{(1+i)^n - 1}{i} \quad \text{OK?}$$

$$\text{Let } r = \frac{1}{1+i} \quad \sum = a_1 + a_2 (1+i)^{-1} + a_3 (1+i)^{-2} + \dots + a_n (1+i)^{-(n-1)}$$

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

What is the series here? $a_1 r + a_2 r^2 + \dots + a_n r^n$. [Why is the first a dropped? To simplify the final expression.] But if we drop the first a, then we are raising the last term to r^n , & so formula becomes $\frac{1 - r^{n+1}}{1 - r} - 1$

$$= \frac{1 - r^{n+1} - 1 + r}{1 - r} = \frac{r - r^{n+1}}{1 - r} = r \frac{1 - r^n}{1 - r}, \text{ simplest form.}$$

$$\sum = \frac{1}{1+i} \frac{1 - (1+i)^{-n}}{\frac{i}{1+i}} = \frac{1 - (1+i)^{-n}}{i} \quad \text{Good!}$$

Now proceed to $r = \frac{1-d}{1+i}$

$$\sum = \frac{1-d}{1+i} \times \frac{1 - \frac{(1-d)^n}{(1+i)^n}}{1 - \frac{1-d}{1+i}} = r \frac{1 - r}{\frac{1+i - 1+d}{1+i}} = (1-d) \frac{1 - \frac{(1-d)^n}{(1+i)^n}}{i+d}$$

$$\sum = \frac{1-d - (1-d)^{n+1} (1+i)^{-n}}{i+d}$$

$$Z = r \frac{1 - r^n}{1 - r} ; r = (1+i)^{-1}$$

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

Works out immediately. Just note, this formula is for 1st term

being ar, not a.

$$\left[\begin{aligned} \text{Check by using } Z &= \frac{1-r^n}{1-r} - 1 + r^n = \frac{1-r^n}{1-r} - \frac{(1-r)}{1-r} \\ &= \frac{(1-r^n) - (1-r)(1-r^n)}{1-r} = \frac{(1-r^n)(1-(1-r))}{1-r} = \frac{r(1-r^n)}{1-r} \text{ Check.} \end{aligned} \right]$$

$$\begin{array}{r} 1.21 \\ .81 \end{array}$$

$$\begin{array}{r} 1.21 \\ .81 \\ \hline 1.21 \\ 968 \\ \hline .9801 \end{array}$$

$$.90 \times 1.10 = .99$$

$$.81 \times 1.21 = .9801$$

So $(1+i)(1-i) < 1$ & get smaller as raise powers.

Another distinctive quality of land. Those wanting to found permanent family seats + that will survive spendthrifts, ~~etc.~~ incompetents, etc., find land the best medium for xbig assets. It's partly inst'l, but is also permanence of land that has made such instrs center on it.

Another quality - from thesis — mnpstrs w. surplus funds to invest, can put most here w. least nec. A gross sales

Stigler, 15

Make this formula more elegant & compact if you can by snipping end points. Then use to emphasize points. Polish this up later.

p. 324 If res. are expended only for short period, int. can be ignored. (True, but his other analysis requires int. have ~~continuous~~ effects at any life span.)

Vernitt, Engr. w. Union Electric of St. Louis. says P.U. Commission requires they use sinking fund deprecn.

Stigler, 14

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

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

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

Tooey, all a matter of end points. Anyway, present value of $\frac{a}{1+i} + \frac{a}{(1+i)^2}$ etc. is $\frac{1 - (1+i)^{-n}}{i}$. My problem is complicated but I want to sum a tougher series: $a + a \frac{(1-d)}{(1+i)} + a \frac{(1-d)^2}{(1+i)^2} + \dots + a \frac{(1-d)^{n-1}}{(1+i)^{n-1}}$

Watch end points by using real numbers.

$$\frac{1-r^n}{1-r} \quad \text{Let } n=4. \quad \Sigma = \frac{1 - \frac{(1-d)^4}{(1+i)^4}}{\frac{1+i - 1+d}{1+i}} =$$

$$\frac{1+i - \frac{(1-d)^4}{(1+i)^3}}{i+d}$$

If $d=1$, $V=a$, int. has no effect.

If $d=0$, $V=\frac{1}{i}$, int. has hi effect

If $d < 0$, say -1 , int. has highly magnified effect.

Stigler, 13

$$\frac{1}{(1+i)^n} = (1+i)^{-n} \quad (r^{-1})^n = r^{-n}$$

$$a, a(1+i)^{-1}, a(1+i)^{-2}, \text{ etc.}$$

$$r = \cancel{1+i} \frac{1}{1+i} = (1+i)^{-1}$$

Present Value: $\Sigma = \frac{1-r^n}{1-r} = \frac{1-(1+i)^{-n}}{1-\frac{1}{1+i}} = \frac{1-(1+i)^{-n}}{1-\frac{1}{1+i}} = \frac{1-(1+i)^{-n}}{\frac{1+i-1}{1+i}} = \frac{1-(1+i)^{-n}}{\frac{i}{1+i}} = \frac{(1+i) - (1+i)^{1-n}}{i}$

Let $r = (1+i)^{-1}$

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

Present value of above $\Sigma = \frac{1}{i} - \frac{1}{i(1+i)^n} = \boxed{\frac{1}{i} [1 - (1+i)^{-n}]}$

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

This is value of perp. $\frac{1}{i}$, less rt. expression

$$a, a(1+i), a(1+i)^2, \dots, a(1+i)^{n-1} \quad r = (1+i)$$

$$a, a(1+i)^{-1}, a(1+i)^{-2}, \dots, a(1+i)^{-(n-1)} \quad r = (1+i)^{-1}$$

Problem. Find present value of ~~the~~ series of future values.

a_0 received immed.

a_1 discd, $\times (1+i)^{-1}$

$$a_0 + a_1(1+i)^{-1} + a_2(1+i)^{-2} + \dots + a_{n-1}(1+i)^{-(n-1)}$$

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

Try subtracting $a = \frac{i}{i}$; $\Sigma = \frac{1-(1+i)^{-n}}{i} = \frac{(1+i)^n - (1+i)}{(1+i)^n i}$

Stigler, 12

Now let's find a simple formula for an asset whose annual yield declines in some plausible way, get a compact expression for influence of i.r. on value of assets.



$$a, \frac{a}{(1+10\%)}$$

$$1 \quad a$$

$$2 \quad a - .10a = a(1-.10) = .9a$$

$$3 \quad .9a - .1 \times .9a = a(1-.10)(1-.10) = a(1-.1)^2 = .81a$$

$$n \quad a(1-.1)^n = a(.9^n)$$

Let $d \equiv$ diminution factor

$$a, a(1-d), a(1-d)^2, \dots$$

Now discount

$$a, a \frac{(1-d)}{(1+i)}, a \left[\frac{1-d}{1+i} \right]^2 \dots$$

$$\sum = a \frac{1-r^n}{1-r} = a \frac{1 - \left(\frac{1-d}{1+i} \right)^n}{\frac{1+i}{1+i} - \left[\frac{1-d}{1+i} \right]} = a \frac{1-r^n}{\frac{1+i-1+d}{(1+i)}} = a \frac{(1+i) \left[1 - (1-d)(1+i)^{-n} \right]}{1+i-1+d}$$

$$\sum = \frac{1+i - (1+i)^{1-n} (1+d)^n}{i+d}$$

$$(1+i)(1+d) = 1 + d + i + di$$

$$(1+i+d)^2 = 1 + i + d + i + i^2 + id + d + d + di + d^2 = 1 + 2i + 2d + 2id + i^2 + d^2$$

Stigler, 11

future i.r. So if i.r. falls, future yields fall, value remains \$100.

But land, fall of i.r., yields in future unaffected [or even Δ bcs cap. gets smaller share] so value of land rises.

If I have \$100 today it is worth \$100 bcs it is \$100. I do need to ~~calculate~~ ^{invest} sum of perp. future incomes to explain its value.

The essence of money is liquidity or immediacy. I+ is \$100 whether it will earn hi or low yields - I can consume it all now if I wish. But land is worth \$100 only by distg future yields.

Sensitivity of land P to i.r. is obscured by fact, ^{sporadic} changes of present i.r. do not nec. mean changes of antic. future i.r. [And are other influences too.] But if overall climate of expectations changes, the short lived asset worth \$105 on Dec. 31 is still worth near 100 on Jan 1; but land is radically ^{changed} if I sink the \$100 in cap. stock for one yr worth \$105 at Dec. 31 it is worth \$100 on Jan 1. Bcs. of what it is to be worth on Dec. 31, regardless of what I do ^{or can do} w. it later.

Also: the cap. yields \$5 bcs. I invested the \$100 ^{to create it.} Land is worth \$100 bcs it is ~~going~~ ^{able} to yield \$5 ~~independently of anything~~ ^{without my investing anything to create it.} I+ is ~~not anyone's~~ hard to imagine a more basic distinction.

Stigler, 10

Try 2 yrs. $P_0 = 100$. $r_1 = 50$, $r_2 = 50$. $n = 2$.

Most people wd. say no income. But Stigler says deprec. in 1st yr. is just, say, \$48 or 47.5%. Etc.

E.g. gets better as n grows. But false interest or double interest or phantom interest of Stigler gets longer.

So OK, Stigler is demolished. He tried to turn depreciating capital into a perpetuity by regarding cap. as a mysterious metaphysical quantity transcending its corporeal form, à la J.B. Clark — maybe this was Clark's motive?

✓ In article cite Stigler's effort to treat evanescent capital as a perpetuity. In footnote mention "The position is easily demolished. Suppose an invest of \$100"

Distinctive aspect of land, its sensitivity of value to i.r. of vs. ~~the~~ note maturing in one yr. Note recurrent efforts to obliterate this distinction by J.B. Clark, etc. A recent e.g. is Stigler. He proposes to treat short-lived assets identically to land. On assumption good is replaced each time it wears out, so you never recover principle but receive perp. series of yields. On \$100 say you get \$5/yr. then $i = 5\%$ so value of asset = \$100.

Fallacy. ~~Suppose~~ Future yields of turnover invest depend in good on

Stigler 9

Say I invest \$100 on Jan 1 & recover \$105 on Dec. 31.

By Stigler I set aside \$95.⁺ on Jan 1 as deprec. By Dec. 31 this grows to \$100, I recover my principle, and $105 - 95^+ = 10^-$ is yield of capital.

Better, I invest \$100 & recover \$100. By Stigler I am getting a yield of \$5.-

Maybe unfair? So suppose I invest \$100 & get yields for 100 yrs. and they are const. annual yields₁^(r) for 100 yrs then stop.

$$V_0 = \frac{(1+i)^n - 1}{i(1+i)^n} = r \left[\frac{1}{i} - \frac{1}{i(1+i)^n} \right] \quad \text{Let } n \text{ be very hi \& } V_0 \approx \frac{r}{i}$$

or $i \approx \frac{r}{V_0}$. I.e. deprec is negligible.

$$V_n = r \frac{(1+i)^n - 1}{i}$$

Suppose my yield is \$1/yr, so after 100 yrs I recover my principle w/o interest. By Stigler I have done well. My annual depreciation is less than \$1, and $[\$1 - d]$ is all income! $d = \$100 \frac{i}{(1+i)^{100} - 1} < \1 .

$$r_1(1+i)^{n-1} + r_2(1+i)^{n-2} + \dots + r_n$$

$$\frac{1-r^n}{1-r}, \quad r = (1+i), \quad \frac{1-(1+i)^n}{-i}$$

Stigler, 8

Fisher's method of finding yields is basic:

$$i = \left(\frac{V_{10}}{C_0} \right)^{\frac{1}{n}} - 1$$

$$\text{Or } C_0 = \frac{r_1}{1+i} + \frac{r_2}{(1+i)^2} + \dots + \frac{r_n}{(1+i)^n} \quad \text{solve for } i$$

?/ figure deprecn, calc. % yield each yr. $\frac{r_n - d}{V_n}$

where $d = \frac{C_0}{n}$. Stig. makes d smaller. As % yields, justifies investments others wouldn't, below margin. Other hand he's also keeping base larger, but if he looks at it that way he ends up with an unrecovered base.

p. 323, Stig. carries this to absurdity, says all cap. goods yield perpetual incomes & their values are sum of those in perpetuity !!
The income is gross inc. less his d .

?/ you have truly recovered money from an invmt. that means the money is really free for new invmt., from which the income is a yield on the new invmt., not the old. ?/ the income of the new has to be imputed to the old, then the so-called amortized money has not truly been recovered. It is yielding no interest of its own.

Stigler, 7

to each yr. charge off actual mkt deprecn of bldg; & int. at ~~that~~ ^{external} rate ~~on~~ on remaining mkt value. If any inc. remains that yr, imputation may be held in abeyance until whole cycle can be evaluated. If inc. remains then, impute by relative scarcity of inputs. But toward end, look ahead & see how are coming out, affects demolition.

Stigler is double-counting! He lowers d by accruing int. on it in sinking fund. Thus he is adding that int. earned by sinking fund to yield of asset!! [He is simul. destroying my argument of any diff. of assets based on life. To him they're all perpetuities.]

To simplify, suppose an invmt, C_0 , that yields nothing for 10 yrs. and then yields one value, V_{10} . By Stig. we cd. set aside in yr. 0 $\frac{C_0}{(1+i)^{10}}$, & thus care for replacement of principle at t_{10} . Everything above this is yield. But this means an immediate yield of $C_0 [= V_0] - \frac{C_0}{(1+i)^{10}}$, something from nothing.

Stigler, 6

when you have irregular incomes to smooth out to evaluate a process as a whole, to make evaluations of future as guides to present decisions.

a bldg on a good site or a changing use site depreciates much faster than one on cheap site, & develops value = 0 when still relatively sound.

Net bldg. value = 0 is same as Ratcliff's equality of rents w. old & new bldgs, & more easily understood & usable re deprec.

Above works badly w. improvements that are never exhausted. Make them a special class, ~~Once their cost of~~ they are not separate from the land. Once their cost is recovered, they are land.

When erect bldg it becomes for a time one w. the land, the two exist together. But not 100%. Bes a, Can still be contracted separately b, Land has salvage value, & every yr bldg deprec

— Usig concept of bldg value = 0 does not detract from need to det. land rent to find this point, analytically. But mkt will do it anyway, regardless of their understanding.

Stigler, 5

Most analyses are sloppy bcs they assume a fixed life. In fact life is a variable that must be found jointly with rate of return.

Can't avoid land even if impute all excess to yield, bcs then must earn that % on invest. in land, [not counting ΔP]

Most sloppy anal. doesn't pursue = mgnt implications, if earn $>$ mkt. on Co., is just windfall, doesn't imply need for adjustments.

Expository approach. Land has a kind of o.c. others lack, largely future use. And this o.c. becomes relevant at a time when o.c. of other assets = 0, so becomes sole relevant criterion for replacement. So those ecsts who throw up their hands & say they cannot (or will not) distinguish land inc. are say'g they cannot (or will not) admit that any businessman ^{or anyone} can have a rational replacement policy.

Value of bldg is not indeterminable, just bcs it can't be sold off the site. It is excess of r.e. value over what you cd. get for bare site. There is value of bldg. When this excess = 0, time to rebuild. Depreciation is an ec. fact each yr — declining value of bldg net of site, down to zero. So annual income has meaning each year. Gross inc. less ec. depreciation. No arbitrary formula has ec. mgnt. here. Annualize only approp.

Stigler, 4

If you are in debt, interest is the prior obligation, then you reduce balance if you can.

To say 1st lien is interest on unrecovered principle. Then comes recovery of principle. Until principle is recovered, there is no question of excess returns, bes of risk. But when principle is recovered, entire income is land rent. Trouble here is discontinuity.

Also, suppose you never recover principle, must you always impute some income to unrecovered balance? No, if you err and invest unwisely, then you suffer a negative income at the time this is learned, value of capital asset falls.

If we assume, as Stigler, that one already imputing right amount to land, then excess of yields over return of principle is all net yield of capital. But if this comes to $\gg$ i.r., mkt., then arises qn. to what impute? This makes diff. in how much you wd. bid for res., & in how ~~much~~ long life to give asset.

If cap. limit & land not, impute to ~~the~~ internal rate of return. This will not hasten replacement bes is no cost but land (if annual price of land is what you're using. If V_1 then has an impact & thus).

Stigler, 3

it repr. actual practice. Also, does it make sense? !? Double counting?

Anyway he then takes this "net income", replaces the cap. good when it is ~~worn out~~, "wears out," and quotes:

"The series of incomes will be indefinitely long since the capital good is replaced each time it ~~wears out~~ wears out." p. 323

Perhaps this is the key attitude of a man who refuses to concede significance of long life of land.

Interesting, one who probably wd deny you can ^{break down gross} distinguish income into land & capital returns, shows no qualms about breaking it into ~~net~~ depreciation & yield — on an arbitrary basis unrelated to actual deterioration.

How should we do it? Value declines annually, excess yield over that cd. be called income, that year. (Value mng not mkt, bcs deinstallation probly prohibitive; but value based on expected future yields).

Or acknowledge idea of annual net inc as illusory, & evaluate life cycle as a whole.

1. Is Stigler double counting? Yes.
2. Is "obscuring something important"? Yes — distinction of land & capital
3. You can't impute return to land until cap. has been canceled for at mkt rate, then land gets remainder? Anyway bring this problem into chapter: capital can be treated as annual input

Stigler, 2

p. 322-23. Suppose a capital good "yields" series of incomes, r'_j each year, after separating its yields from others by "the usual m.p.y. analysis." Assumes "the i.r. is known." (But comes out with a net income that need not = remaining value $\times$ i.r., so he could have his asset yield $>$ i.r. or $<$ i.r. In which case it seems absurd to cling to externally fixed i.r. as he does.)

Here comes a gn. like Boulding etc. Max. internal rate of return? Impute to land? Or what?

In gnrl., only by coincidence will a cap. improvement wear out physically at the moment it has paid for itself fully, with int. ^{also life, n .}

Stig. assumes V_0 & i externally given. Then computes how much to "set aside" for sinking fund in rote accounting way, residual is yield of the invmt. Seems to me tho if this yield greatly $>$ i.r., raises gn of assumed imputation, etc.

Stig. 'sets aside' const. annual deprec. allowance, d , which is annual amt of V_0 in yr n . ~~the~~ $d \frac{(1+i)^n - 1}{i} = V_0$ Straight line deprec., and $r'_j - d =$ net income of cap. asset that yr.

There is a rigidity to this that bothers me — gives feeling of being usable to justify fixed d -values based on historical costs. Other hand it gives $d < \frac{V}{n}$ and I wonder if

Stigler, George. The Theory of Price N4: Macmillan, 1947

pp. 321-22 plays down distinction of land & cap. w/o, however, committing himself 100% --- just 95%. Also p. 372. ~~also p. 372.~~

p. 324^{& 324n}, suggests ~~6~~ 6 mos. as boundary, below this

"interest on their investment can be ignored & the cost of a resource is the sum of the values of the services used in constructing it."

p. 327 An invention with Δ mp of cap. if it is "labor-saving." Says nothing of land saving, but should. And here is another basis for distinction of land & cap. Says Easton agree inventions on balance Δ mp of cap. & this = saying they are labor saving. But land saving involves clearly Δ mp of cap. — also land developing ones.

p. 332, imputes desire to distinguish farm land from locomotives to conservation ethos, loss of fertility is irreparable. Here is indeed another issue to consider re distinguishing land from improvements.

In refutation of type of quibbling Stigler uses. I wd. introduce his comment, p. 332 "This practice, however, has only two obvious purposes: fraud . . . ; and the complicating of definitions."

~~macro-econ.~~

Good

Xfr rent and Macro-e. rent: land vs. labor

21. On xfr rent I do hv something new to say. It's not a ^{single-valued} definable concept, bcs depends on how remote from present use the alternative use must be. In gndl can reduce xfr rent to 0 by noting best alternative is work for competitor same job. ^{kind of so surprising} A Xfr rent ^{that never has elevated} ~~that~~ never has risen above the dignity of the debate's ^{trick gambit it origly was} So only kind of rent that means anything is macro-e. Rent of land never was defined as return over best alternative; but over zero. a surplus return over what was nec. to call the ~~surplus~~ ^{surplus} into being in primo. [Not over leisure use, either, bcs land can be used for recreation. But that wd. be false analogy, too, bcs. it is not land that takes the leisure, but those who use it.] [Whereas w. labor, leisure has a positive value to the resource itself - indeed ^{most} ~~many~~ of us regard this as the main object of the whole struggle]

Value of leisure rises w. assets of people. Hence w. value of human ^{contribution} o.c. ~~sacrifice~~ rises. At margin, pay for labor reps. this human input & sacrifice

L.R. s response is irrelevant, bcs price of human leisure changes. S.R. response usually elastic, price of leisure remaining constant

S.R., labor supply elastic, land inelastic.

L.R., v.v.!

LLR, back to S.R., ~~Matches~~, pop. As on fixed land base

Anyway, ^{agrees} supply of ^{human agent} ~~labor~~ all reps a sacrifice of the agent's leisure. ^{which has value} Supply of natural agent doesn't - its leisure has no value.

Cruelty of land vs. labor is not that supply is inelastic, but that it represents no human contribution. It is only a ~~trick~~, an unworthy ~~move~~ or debater's device to limit the relevant considerations, declare them the only ones, or rather proceed as tho they were, w/o actually saying so.

One reason economists have had such trouble putting \$ value on recreational use is they have forgotten this simple truth, human leisure is worth money. Now, recreation economists beginning to awaken to fact, will solve problems.

What about interest? Idea now is human ^{costs off} ~~secret~~ cap. in ordinary process of living, more or less as he does garbage, & no reward is nec. Again, there is the essential difference of human contribution. Elasticity of supply is not the issue. Human has alternative of consuming cap. (or not forming it). Value of this, at margin, = i.r. x Value.

Distinguish consuming cap. from ~~putting~~ consuming inc. or implicit inc. from cap. Putting cap. to resid. use, e.g., is not consuming the cap. corpus. Land too has this alternative. Dramatize this distinction

Exhaustible nat. res., partly like cap. Distinction remains as to origin, however. Anyone who says it is just or exactly like cap. but exhaustible is suspect of debating. If he is intelligent enough to see the similarity he must also be aware of the difference.

4. Tolley goes to other extreme & says land supply is perf. elastic!!

Imputation vs. distribution - any difference?

If we account cost of land at MP to highest rival, then if used below potential we wd. be assuming hi imputation to land, some other input bears deficit.

1. Imputing share of income to land.

Earlier, got special treatment at conceptual level. Now seen as parallel there, but special ~~at inst. level~~.
traits ~~no~~ warrant special study.

Imputation, & latent rent — Over time

It is a widespread fallacy to take a site & underimprove it w. some durable asset, by a p.u., then depreciate it faster than nature does.

This lets you charge higher rates & pay lower income taxes, by understating your income.

Padded salaries, mtl bills, etc — many ways of making off w. rent under some other name.

So better solution to deprecn problem is, with new ones, to ~~amortize~~ amortize only as it depreciates. Rest is income. It imputes to new invmt only in part; in part, excess over mkt return, to site. Latent rent always included this — now it is realized, (in part).

If improvement is permanent, is no depreciation. Ad inc. is ~~fully~~ ^{frequently} largely latent rent, tho improver will surely try to claim it. Improver gets mkt (his mkt) return on invmt. Remainder is rent, ^{one} latent ~~latent~~ ~~latent~~ now realized.

Σ devices for disguising latent rent.

1. Impute as income of improvement, ^{bec. it is realized by improvement}
2. Exaggerate depreciation of " — — & at end of life, shift to some other rationale to write up value of assets
3. Overstate value of mgmt services

I wd. be falling into fallacy #2 above if I said write off perm. improvements as fast as can. Ad income from them does not all impute to them even as income — it is latent rent largely. Charge mkt int. on the improvement in perp., then, & permit pt. trade in perps??

15/2/44

Given an improvement that will last centuries, are 2 alternative ways to handle it.

1. Impute all the Δ net γ to it until it is paid for, then consider it incorporated in land.

2. Amortize it over its lifetime, impute all else to land.
(needs forecast of life, just of some annual deprecn)
This has drawbacks of ~~foreign~~ ^{forecast of} ~~life, which may be~~
~~impossible~~, & of dragging the process out over long time
when changing price levels make problems. γ

If its life expectancy is inf. there is no amortizn., just an int.
charge on original cost.

The "explainers" or Panglosses will claim both ends. best of both
view points. When electric co. builds dam they insist on it. to
amortize rapidly & set hi rates accordingly. But when facility is
amortized they point to it as product of their enterprise &
remark on the impossibility of separating natural factors from
human improvements & impugn the intelligence of anyone
who suggests they are now earning an income on something
received free from the public, & not on their improvements.

✓ Imputed rent works only one way, to minimize "named rent". If do badly, ^{charged} ~~costed~~ at
loss is imputed to rent ... all mngs salaries, int. & return of invnt, etc., are ~~costed~~
cost. If do well, however, is due to superior mngmt, or to credit of intrepid
investors who risked all, etc. — not to rent.

15/2/44

Reason for treating land as resid. Improvements + land yield income, how impute, ~~and~~ land has cost of production.

Esp. nec. where physical corpus of improvement remains after amortize.

Maybe this is another distinguishing feature of land.

"Appraisal theorists are in general agreement, however, that land value may be estimated by assigning a portion of the total returns from land and building in combination to the amortization of an assumed building investment and capitalizing the remainder to secure land value." Wendt, LE, 33:229

a distinctive aspect of land not previously brought out:

Not part of user cost (bes. doesn't deteriorate in prochn.)
This is indep of whether it may depreciate fully.

Not part of $srmc$ of production, $\therefore$

Was once argued that landlord held a fm. Now. Fed. inc. tax laws recognize clearly he has none, as such, & if he avoids all appearance of managing his land he can qualify for special tax advantages on cap. gains, & also by having lands held by tax free "v.e. investment trust."

Inc. tax also requires distinction land & capital. Is interesting to note no one has advanced this as argument vs. inc. tax.

There is no need to fret over whether the destructible parts of land are really land. They are. The only needed modification is to note yields received by depletion are not all net income. There is a user cost attached to some uses of some lands, some of which are sometimes economical. Since the return corresponding to depletion is not income it is not ground rent.

Depletable elements shd. be treated as priv. property. This is no great problem either. Let govt. sell these to privs, but retain the fee (& all mineral etc. its other than those sold.) Annual tax based on fee then.

Let's regard U.S. as having sold soil to firms when sold domain, but having kept ground. And of the soil only a part is destructible, or at least is ordinarily destroyed, so as farm prices have risen over 100 yrs a large part of the soil has risen in value from external causes. The assessor has a Rule to follow: put value on those aspects externally determined... so that tax will never be on productive behavior.

Lower i.r. surely means higher present values of fund resources, hence higher allowance for given amount of depletion, hence lower nat. inc.!

Central place of land in ec. theory lasted longer than
Ricardo. Francis A. Walker award is now highest honor
of AEA. Ely founded AEA. Is also J.B. Clark
award.

Clark & Walker awards established in 1944-45 Commec Mtgs.

^{M.I.T.}
F.A. Walker, 1st Pres., 1886-92

J.B. Clark, 3rd Pres., 1894-95

R.T. Ely, 6th Pres., 1900-01

H.J. Dewenport, 22d Pres., 1920

T.W. Schultz, 62d Pres., 1960. Declining importance of land.

~~Bye, C.R., with Doran & Hinman, Urban Land Ec., that~~

Improvements made long ago & merged w. soil can be regarded as part of land, now, & very justly. Bes. most human works depreciate, deteriorate, crumble in a few years. If certain lands offer the oppy to install improvements that last forever, then it is the land that is unusual, & to which the income attaches, & not the improvement.

E.g. if I fill in offshore lands w. ordinary fill, in a site where the operation need never be repeated, I get my money back with interest & thenceforward cannot claim any income imputable to my efforts. & Certainly no rational site holder would so regard it, & it is irrational of econs to advise their govt to do so.

Thus an improvement may live on physically when it is long since amortized. Its productivity is then imputable to the land. Even before it is made, the land should command a price premised on its being made, since it is possible. Failure to take advantage of such an oppy. should be penalized - it is practically a crime, & certainly a breach of landholder's trust to society.

Doran & Hinman, Urban Land Use, p. 466f., include such improvements as land?

Ricardo excluded depletion from rent. Principles p. 48

Bye, 2

Rent is what you pay for hire of something that doesn't wear out. Land is only thing that never wears out, so is legit. on this account to apply rent just to land.

J.B. Clark, Essentials of Ec. Theory, p. 159, said land is not worth distinguishing from "other cap. goods", & only became so bcs. customarily rented rather than bought. He evidently regarded this as a passing custom peculiar to 19th cent. Eng.

— Stress + his distinction: ^{gross return} ~~gross~~ imputable to capital, must deduct deprecn & turnover before arrive at net income. Land income is all net (save for depletion, a minor element, and one which I should remove by def. before I get to this point

— Even J.B. Clark conceded in dynamic state the diff. of natural & produced resources was imptant. Distr. of wealth, p. ~~177~~ 189. I.e. everywhere except in make believe world, dream world

— Emphasize Malthus — natl. res. are limited. Was a fashion for a time to play the game of denying any distinction. But this was more of a parlor game to annoy ~~the~~ & discomfit the land-taxes than a serious postulate of ec. science, & every upsurge of population, w. its inevitable evocal of Malthusian anxiety, has brought clearly to fore the importance & reality of irreproducibility & limitation of nat. res.

Bye, 3

Looking back, these early squabbles seem quite childish & semantically naive. Today the cult says "He who wants to draw a distinction, let him draw it; the important thing is whether he can do anything with it."

J.B. Clark's insistence on this point seems more like a debater's ruse for indefinite postponement of an unwelcome topic.

Another point of difference: i.r. is determined by productivity of capital. W. land, ~~productivity~~ yield exists indeply of purchase of title, whose value is det'd by reasoning backwards using an i.r. det'd by productivity (marginal) of produced capital.

The difficulty of distinguishing land from commingled ancient improvement has bothered some, e.g. Byer, far more than it merits. Make a striking e.g. Suppose glaciers hv. left a swampy valley, ~~the~~ dammed by a low moraine. Suppose one cuts thru this by one day's labor & a ^{milli-}~~meter~~'s wear & tear on a spade, thereby draining the swamp in perpetuity, which promptly yields vast returns. Must we ever after puzzle over how much ^{of a lien on land} return imputes to the day's labor? Clearly absurd. Pay off from first yrs produce, & henceforward treat drainage as part of the land.

Bye, 4

Gives excellent statement of difference of land & capital, pp. 79-89.

Only weakness is concession to problem of commingled improvement.

Francis A. Walker. Land & its Rent. Boston: Little, Brown & Co., 1891.
(but written & copyrighted 1883)

Attacks weak point in P&P that Δ productive power is solely demand for land.

Check H. G. Brown's condensation, did he excise this? Check SPE - did George ever answer?

The attack is no masterpiece, and extremely caustic, sarcastic, & prejudicial. But he is probably right on this point.

He also attacks speculation & instability arguments, but w/o substance. George should have rested his case on them.

The violence of Walker's attack suggests he may have such leaning himself. He is at least a Ricardian. And in last chapter he comes out strongly for promoting middle-sized owner-occupied farms, if nec. by State intervention, altho he doesn't think that is nec. now in America.

I judge his resentment of H.G. is as a rival prophet rather than a defender of privilege. But he is complex, and at times he seems to be motivated by upholding the ancient lore he regards as his personal monopoly; at others he chides the classics for overstressing harmony of system, thus by process of elimination leaving rent for George to attack.

Francis A. Walker, LAND & ITS RENT.

p. 198 " . . .it is admitted by all sound writers on public policy, that property in land differs markedly and materially from property in capital or in the products of labor. If both species of property are "sacred," to use a familiar phrase, landed property, by almost universal consent, stands lower, much lower in the hierarchy than property in capital."

Cites approvingly Roscher that private property in land is a "semi-public function."

pp. 194-97, Walker criticizes classical economists for admiring forces of free competition. "Shut off, then, by the economists themselves from finding here the cause of 'the association of Poverty with Progress', Mr. George turns to rent as the source of the economic evils he describes; and it is difficult to see how he can be answered by those who stand committed to the dogma of the economic harmonies." The need is to be more fuzzy, and to advocate various fuzzy social controls over land use, evidently.

Thus, how ironic, it later became necessary for Georgists to defend the classical economists so that the authorities they attacked would still be in authority!

Trigger recession.

Can also Δ turnover by lower margins, but if stimulus is higher rent, this mode unlikely. Rather, reduce variety.

Outline: substitution of land & other resources including use of 3d & 4th dim.

Demand for downtown land pushes up into 3d dim. & also into 4th: longer hours, but more: rapid turnover of goods.

Little space used for dead storage, slow waiting type service.

If high land prices cause substn., one form this wd. take in merchandising is faster turnover of stock. Thus do more business on same land. [High i. r. today push same direction,] [but small effect].

This means carry smaller inventories, give customer less choice. Also, more hurry-up gimmicks in merchandising, hurry him out of store.

Thus reduce invmt. in inventories,

Ricardo is probly guy who started us off on
this "rent" jag, all confused, rent as
"surplus" or differential.

"(1) location cannot be explained unless at the same time trade is accounted for and (2) trade cannot be explained w/o the simul. determination of locations." Isard, p. 53, Location & Space-economy.

re Ohlin's Interregional & Internat. Trade, Cambridge, Mass., 1933.

Ohlin begins w. assuming mobile labor & capital, location determined by strategic nat. res., in center, e.g. coal deposits. Then says internat. trade theory is just internat. location theory. (Viner is cynical)
From Isard.

So: I.T. theory demands distinction of land & cap. Internat. boundaries reduce the distinction. Unions do still more.
Serfdom most of all.

Transportation costs are meaningless save in terms of fixed location of land. Those who say there is no difference must wonder why spend m to move things from one place to another. Isard has gone so far as to suggest xptn inputs shd be set aside as a basic category on same level as land, labor & capital.

Isard, p. 205, says "Transport outlays in terms of both time & cost are borne by the consumer . . ." re urban land.

Thus he's clearly thinking just of customer xptn variable cost, not street costs.

Nature of land's productivity:

From concn of surround'g popn, Δ demand, w/o Δ capacity to meet demands (altho given capacity may be more fully exploited)

From Δ productivity brought on by improvements in human orgn & technique — i.e in its complements. Has effects similar to Δ supply (but is not quite same, there are differences of note).

✓ Value of products is ful., fn is to cause them to be produced, & maintained, & continually replaced as they continually wear out.

Value of land lacks this fn. Land income is nec. for allocation, but land value is not nec.

Products must have a value as incentive to produce; & then an income to allocate, as well as to support the value. Land needs only the income, to allocate. And were we to levy a flat ~~the~~ annual charge on land, just less than the max. income it could earn, we wd. not interfere w. allocative forces, but on contrary magnify them by giving them much greater leverage than now.

On actors' hi incomes, see A. Smith, p. 100: scarcity of actors prevails because low prestige, despite high publicity heaped on successful. So supply is not inelastic, & it's not all fun, except from the other side of the fence. Element of jealousy evident in income-taxers, but they think actors life is fun.

Distinguish instl. rent from ec. rent. Instl. rent lags, so some ground rent goes to tenant. "Rent control" by govt. is just an extreme case of this. Failure of published data to reflect fringe adjustments overstates it.

Fear of expropn; or lag on upswing; reduces tuncy. So not w/o practical effects. But in one important sense, rent control does not affect bnl. distribn, but changes ownership of land, gives tit equity.

Price & rent control, try to affect distribn. But hard to enforce. So instead, withhold supplies, or augment supplies of complements. (or, if supply of labor inelastic, conspire to bid low). Thus affect distribution.

Max. wage control, other hand, Δ s ec. rent & l.v., how come? The counterpart of this is not rent control so closely as it is min. wage law, which seems to reduce ec. rent. But one cd. say min. wage law lets labor share in ec. rent, rather than reducing it. W/o monopsony, if law created unemployed, the employed wd. have some ec. rent, & in one sense their entire wage cd. now be so regarded since free wage has been driven to zero.

Lvt reduces l.v., but does not thereby reduce incentive to improve & dev. new lands. Rather, shifts incentive from prt. landholders to the sovereign. This does not Δ role of sovereign in devg land, but govt does this anyway. Only now it acts in response to prt. pressures exerted by logrolling, lobbying, jobbing & bribery. Then it cd. undertake to act more consciously in public interest.

See SPE p. 308 ff. on land vs. cap.

Fn. of hi land p in calling forth more supply. Has to be understood in terms of ~~some~~ distinctive character of land.

Distinctive but not unusual, nor unimportant. Contrary, one of most basic^{ec.} phenom. But appears unusual in terms of received ec. theory bc. latter has not evolved to handle it.

calls it forth not by improvements on land; but on other land. Not by single owner as rule, but by group, or some unit of govt. responding to pressure by groups of owners [or on own initiative to Δ its revenues, but this is not due to hi price, unless govt owns & will sell land], or to expand its influence, pol. or ec.

Total supply is often regd. probly more often than not. by cartel type policies. Is perfect mechanism for distribg cartel gains among members, min. quarrelling over mkt. sharing. Size is detd. by landholding (plus restrictions on intensity of use) no need for base period sharing, or policing quotas, or formal agreements that violate anti trust.

Not entire scarcity of urban land is artificial, ceteris. Is a natural scarcity due to centripetal forces, Δ g returns.

"Ground rent" is short & accepted.

"Land income" better yet? E & W suggest.

Superior mgmt may impute more rent than inferior, in fact customarily does. But mgmt returns are (or shd be) = $d\frac{x}{x}$ by giving more land to superior mgr.

Surplus from superior mgr goes to mgr or land, depending which is scarcer. E & W work out ok, p. 131, citing H.C. Taylor, "Rents & Profits," ch. 17 of Outlines of Ag. Ec.

MP $\neq$ resid. rent is non-eg. anomaly. But how can such so long hv. prevailed? Res credit factors.

Leg. Xptr tests, on effect on land use.

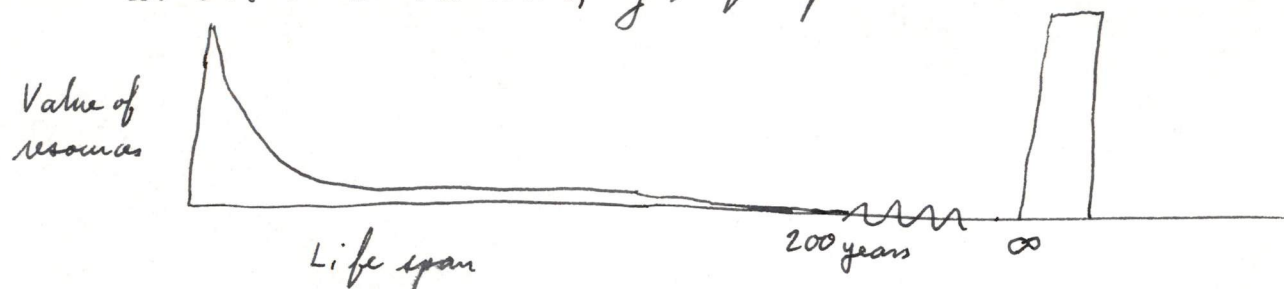
"Ripening costs". Like "fn of landlord"; they are individ. but not social costs.

Land distinct from products in that in short time any product price is checked by reproduction, cost of production. Not a clean distinction tho bcs its production involves land. Still, if there is a limiting factor, it is land, & that gets the rent or producer surplus. Product price also remains hi, but products turn to scrap, decompose, die.

Factor distinctions, cautious refusal to acknowledge, breathes of willful self-deception. Are obviously of huge practical importance.

Other hand, struggle vs. factor distinctions manifests search for continua, suspicion of arbitrary lines. OK.

Put resources on a continuum, by life span. Get this:



Seems adequate basis for distinction.

Is not to deny change in environs, etc. Contrary, that is implicit in saying other res. die & change. It is physical corpus that is permanent.

But other qualities are ~~more~~ longer lived than most other res.

They say land can be supplied by bldg roads. But here is yet another ^{distinctive} ~~unique~~ attribute. The roads are built on other land

Commonly thought distinction of land & improvement is a remote academic interest & practical world pay for both together. But practical man must deprec. one & apprec. other, quite a diff.

Fuzzers speak of improvements merg'g w. land, but fail to bring out vital distinction of those that are on the land, & those around it that serve it & affect value, & certainly are changeable.

Garner & Hansen's time, 1927, argument was that rent not nec. to bring forth supply of land. Equally, re fur. of landlord, his func'g not nec. to bring forth supply. In aggreg., is self-necessitating.

Rent must be paid, yes — but it need not be received by private landholders; the state can collect it just as well.

✓ "... private receipt of rent is not necessary merely because the rent performs a useful function." Knight & Hines, p. 515

"Welfare" etc. may involve idea you gain Δ welfare by distributing inc. (or assets) more equally. If so, I shd have section on Lorenz distributions of land vs. other assets.

Welfare etc involves idea of compensating the losers, by taxing the gainers. Here is entry for L.V.T. Take as contrast European method of spreading out urban rent by limiting bldg heights, vs. permitting the degree of spatial clustering that free ex-feras prescribe, but taxing the beneficiaries.

Mill says rent does not enter into cost of production. This confuses some issues. The o.c. of any input enters into micro cost, including o.c. inside industry. Macro, as we take larger views, get intermediate steps. But as long as we talk of price, we are micro.

In macro view, is no price. Just general productivity. Returns are determined by mp.

There is no "rent" until is only one buyer. Otherwise there are alternatives - other buyers.

Land is less mobile & harder to sub. for than other inputs in micro segments. There is such truth as there is in this idea.

Land income (& mp) rise & fall as demand shifts, & cannot shift ~~to meet~~ with the demand as fast as labor & cap., sometimes & to some extent never.

But in aggreg., are no prices. And if we view all resources as producing products for a price, then all returns are "price determined."

Cite Buchanan(?) article where this is nicely worked out (if somewhat prolix)

Actually Mill's argument is different (& weaker). He says rent doesn't enter into cost bcs you hire a production agent with it. Pretty fuzzy use of words.

What are these "other rents" they write of? Besides bafflegab.
Many are forms of landownership, & I wd. agree shd. be taxed
(or abolished). E.g. taxi licenses.

False analogy. Paying Δ rent on ^{intra} ~~infra~~ mgnl land is not nec. to
bring mgnl land into production, bcs mgnl land is free. But higher wages
to ^{infra-} mgnl labor are nec. to bring in mgnl labor.

~~also false~~ analogy: Δ money rent brings land out of use yielding owner implicit
income, just as Δ money ~~rent~~ wage lures labor from leisure?

Leg. Bye, Issues in thry of rent.

Leg. Walras, on rent. Marshall, Mill.

No! The residential land is still
in use, yielding services. The idler
is not.

Say a word about cold bloodedness of people who ed. hold labor is
just another res., its leisure is same as land's. Forgetting whole
object of game is Δ welfare of people.

Human element in production is forever set apart as object of it
all. People consume, & decide. Land doesn't.

Re welfare ecs, mention remarkably little attr. to time & capitalizn
problem.

Pigou falls into no sloppy errors re "taxing rent". Stresses that
base must not be alterable.

You cannot say hi wages are rent but are a differential, but that is not essence of it.

I cannot say supply elasticity in short run is essence, but then durable cap. is land.

But I cd. say supply elast. w/o regard to income effects is essence? Or if just the last unit were better paid, but not inframarginal ones. This may be legit, too, if Δ wages means less inc. from other sources.

Re Taxes, inc. effect is incl., since all taxes have it.

Samuelson says hi tax rates, p. 593, do not discourage ~~people~~ the supply of effort of gifted people, but risk-taking & venture capital. (I doubt, but govt. bears risk of loss). This reasoning wd. lead to tax labor inc., not capital.

a. Smith stresses need become incentive to sovereign to Δ his income by public improvements. Thus if ~~so~~ Δ land rent all went to Fed., it wd. get busy & improve!! Problem solved itself?

" . . .most of the high earnings of outstanding individuals can probably be classified as "pure economic rent." Joe DiMaggio earns more than \$100,000 a year playing baseball, something he likes to do anyway. Outside the field of sports it is doubtful if he could have counted on earning more than, say, \$5,000 a year at most. Between these two limits his supply curve is almost completely inelastic, and so we should term the excess of his income above the alternative wage he could earn elsewhere a pure rent, logically analogous to the rent of nature's fixed supply of land." Samuelson, p. 593

And yet he has earlier chided Ricardians, saying that rent is not essentially determined by the differential, but by the limited total supply. p. 574

With these micro rents, how wide should we define the field. Samuelson does not even limit it to baseball, but "field of sports." But one could say he has alternatives playing with other teams, which he might not like as well. Or in the Mexican League, at higher salary, which many Americans refused. Etc.

So this is pretty shallow. ~~4/574~~

So this is what is meant by "other rents." Non-uniformity of, heterogeneity of labor supply. But Samuelson has mingled two distinct ideas here. Inelastic supply of labor, which could apply to whole supply; and differential position of one individual.

Some people like their jobs. Is essence of anti-idea. But must we all dislike work in order to justify pay'g us? Seems pretty rough.

Samson ^{p. 593 e.g.} & Bldg, extreme & indefensible allegations re labor rent.

What is sloppily called "inc. effect" is really asset effect. $\therefore$ long run. (also, but reduces assets, not just by taking on but deflating cap. values.)

✓ — Outline: section on elast. of supply

Sam, p. 562, sloppy, talks of a "tax on all land rents. ... " + the yield of the naturally fixed supply of ag- & urban land sites ..."
Not absolutely clear if is discussing ~~the~~ ad valorem or income tax, but sounds like income. If so, the relevant supply is not fixed, but is alternation of non-use, & non-money use, & less-money use, etc.
There are things income-taxers are barely aware of, hence can write blithely on w/o clarifying postulates in these regards.

A public improvement ~~give~~ creates rents to all supermarginal users. Land rents will be permanent. Labor best helped will get a temporary windfall, exactly analogous to capital windfalls, which will also occur. But labor & capital will immigrate, ending windfall. (& further raising local land values)

Only aspect of labor that will not 'immigrate' is the genetic. It cannot. Some say this sort of rent should be taxed, being 'undeserved', inherited. But to put such a program into effect, if it were possible, would be to discourage all

genetic improvement. For genetic qualities are produced, as children are products of labor. Alas, the incentives today are so slight that we get no genetic improvement. But no excuse for making them worse.

Temporary taxes on labor & cap., to compensate for this windfall, might be ok.

Re "Tax issues as affecting def. of rent."

George does not propose to tax rent. It is symptomatic of what careless readers some of our economic commentators are that so many of them could have attributed to George this proposal, or so characterized his proposal. Or, rather, it indicates at least what sloppy scholarship and analysis has been allowed to pass by as criticism of George (altho in fact these same books are pretty sloppy about a high number of things, so single tax has not been singled out for abuse.)

George rather carefully chooses his words to avoid this. "Taxation which lessens the rewards of the producer necessarily lessens the incentive to production; taxation which is conditioned upon the act of production, or the use of any of the three factors of production, necessarily discourages production. . . .Taxation which falls upon . . . land as it is cultivated, will manifestly tend to discourage production much more powerfully than taxation to the same amount levied upon ~~laborers~~ . . . land whether cultivated or left waste."

Samuelson et al do not entertain the idea that it may be left waste. They speak of the vertical supply curve, as tho it would all be offered for use regardless. This is not George's gimmick (altho I cannot say that none of his supporters have ever used it.)

"The mode of taxation is, in fact, quite as important as the amount." p. 409.

Further in this section, George never speaks of "taxes on rent," but always of "taxes on the value of land," i.e. ad valorem land taxes.

He recognizes "other rents," but says ". . . it is much better that these monopolies should be abolished."

He emphasizes, not the fixed supply, but the increase of effective supply from taxing land values.

p. 410, grows a little careless. "But the great class of taxes from which revenue may be derived without interference with production are taxes upon monopolies . . ." Doesn't define the tax base here. But context indicates he would oppose any tax conditioned on production, even by a monopolist.

Nowehre do I find him speaking of land as fixed in quantity. p. 233, he points out that increased productivity, associated with increased population, increases production from given lands, might even increase wages at margin. p. 234, ". . . for the increased powers of cooperation and exchange which come with increased population are equivalent to -- nay, I think we can say without metaphor that they give -- an increased capacity to land."

Land supply in aggreg. is expansible, economically.

Land in certain locations is not. Rents accruing in such locations are for land alone. Labor & cap. immigrate.

Land is much less adaptable than labor & capital. In location esp., except in the sense of chang'g xptn, but this is strained, bcs land is passive, it is the xptn that adapts.

But notch if we focus on demand for location, land gets the rent. But suppose there is demand for special genetic qualities, e.g. buxomness. The genes get the rent. But ^{the quality may be both developed & stimulated; & it has} ~~substitution is far easier here. &~~ some strongly competitive substitutes; & it is of little or even negative value w/o complementary charms. ~~effective stimulation~~. It is doubtful if much differential income is received on the basis of this quality alone. If ~~some~~ some is, hardly a major inequity. And if were, wd. be totally impractical to ^{assess} tax buxomness. But I for one am not content to conclude, bcs we ~~cannot~~ ^{do} tax buxomness, in $\therefore$ immoral to tax land.

Unique
Human qualities are either inborn or acquired. The acquired ones are duplicable, & an ~~ad valorem~~ ad valorem tax wd. discourage their acquisition & deprive society of benefits. The inborn ones might conceivably be taxed, but ~~they are~~ in practice we do not know enough about what is ^{genetic} ~~hereditary~~ & what environmental. If we did, a tax ^{assessed} on superior genes wd. ~~still penalize~~ be about as counter to the public interest as any imaginable. It wd. burden & discourage ~~the~~ genetic improvement, & deprive superior individuals of ec. opps for education.

As to capital it is almost entirely duplicable.

So the "other rents" proposition is almost pure nonsense, upon analysis.

Except in macro sense. Suppose demand for labor as a whole Δ ,
(e.g. thru Δ consumer prefs. toward labor-intensive services.)

Justify payments to factors to call forth inqrd supply. But land,
altho supply is elastic, is not called forth in same sense by payments.

"Nature" is somewhat misleading term for land, but land's productivity depends on surrounding human activities, as evidenced by "public value" used by Marshall & Pigou.

In agric., production may use more "nature", but less public value, or location value, which depends on people - where they live, what they have built.

Old concern was over share going as rent. Today shd. be more upset over failure to collect rent.

Ricardo & his ff. emphasized differential aspect. Some said if land uniform, no rent.

But if land uniform, cd. still be rent, if scarce. So "differential" merely distinguishes grades of land.

Single-tax, as interpreted by most expts at least, was a proposal to "tax pure rent." And its lack of depressant effects was due to fact "rent" was a surplus, factor wd. be supplied anyway.

I say essence, as far as announcement effects go, ~~is~~ ~~to~~ is how you tax, not what. "Rent" is just a conventional, residual way of talk'g about & conceiv'g a payment. But regard it instead as mp of land. Now levy on this as an income, contingent on draw'g it. Immed. evident some land wd. be withdrawn, & all land partially modified. For all land is in multiple use, there is a continuum of alternatives, between those yield'g no inc. & those yield'g direct gratification to holder. Tax rent ~~on~~ on English system & landholders react just as to any inc. Tax. (save w/o ~~any~~ ^{much} income effect, if small share of total inc.)

Conventional idea there is a fixed o.c. [Reps. ^{dummy} type of thinking requiring black & white compartments, ~~and~~ (exemplified by period analysis, insistence on "hoarding" concept, action thresholds, exaggeration of indivisibilities, etc.) & refusal to grasp ^{cc.} concept of continuous variation. Often just fear of math.] And idea is useful, ^{simplification} properly understood.

But like every mental crutch it threatens to atrophy elemental reasoning fns.

But in fact, lower net rental return & part of every land is ~~not~~ readjusted. Fmr, e.g., will leave more cover for quail & grow less grain. Lest this appear as solution to recreation problem, note he will tend by same reasoning to ~~reject~~ ^{repulse} visiting hunters & keep shooting for his own pleasure.

But maybe conventional crutch handles this by saying there really wasn't much rent? Not much intra-industry rent, anyway, altho is all aggreg. rent.

✓ Crux of rent comes out in taxation issues. Inc. tax phil. is that much is rent, all will be done regardless.

Is contradiction, anti. lvt says rent nec. to allocate land; but you can destroy price system via inc. tax w/o ill effects!!

The "supply" of land is fixed only in an ^{economically} irrelevant physical sense. The supply available for uses that yield monetary incomes is elastic, & if a tax were levied contingent on earning such income, e.g. & to it, the supply wd. diminish. True, this wd. Δ the supply for non-money-yielding uses, but due to worsened allocation this is smaller aggreg. supply.

Vocab: distinguish "micro" from "macro" rent.

Samuelson, p. 565, like many others, tends to lump increment taxes & "taxes on rent" & lvt. Discrim. needed.

Says fixity of land supply is basis of H.G.'s single tax proposal, but factor wd. work for less if it had to. I doubt. George did not claim lvt wd. leave land supply unchanged, but wd. Δ it. Sean George, did he ever mention fixed supply? } That is a reinterpret by
 cuts. } no!

Products are taken by labor from the reservoirs of nature, and tend back to those reservoirs again just as water tends back to the ocean. Most products indeed are consumed immediately. Others require the constant exertion of labor to keep them from relapsing into nature's reservoirs. (condensed from SPE p. 308-09)

Land consists of the surface of the earth, of which there is only one. It is distinct from products in that products always at all times rest on land, require land on which to be located. Even airplanes have been made private property, and closely monopolized at that, and present no problem different from shipping lanes. Occasionally layers of land exists one atop another, e.g. airplanes above shipping lanes above fishing rights above tonging rights above mineral rights; or in cities, air rights above surface rights above subway rights. But in all these cases the products rest on the land in the sense that the space they occupy is land

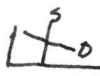
Land ^{is} ~~consists of~~ *the natural environment usable by man, consisting largely of* space on ~~or~~ and accessible to the surface of the earth. Products are distinct in that they always occupy this space, whereas land is the space occupied (together with the physical endowments, natural, of that space that have not been destroyed, and, for practical purposes, ~~such improvements~~ human modifications ~~as~~ whose origins are lost in antiquity.

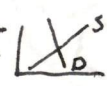
The land comes first, and can exist alone. Neither labor nor capital could exist w/o land, however.

True, its scarcity, or scarcity of certain units of it, are not necessarily permanent. Scarcity breeds substitution, so new cities are slowly founded and challenging old ones.

Old bldgs that last 1000 years are famous — precisely because they are so unusual. The ~~weakness~~^{limits} of any ec. theory are evident that must rest on ~~the~~^{a few} Gothic Cathedrals. But all land is that old & millions of yrs older.

You can change elastic. of supply by changing def. of factor, or demand.
E.g. say item is "land in the loop". S curve is vertical, absolutely fixed.

Demand however wd. be quite elastic: I: 

Now say "Commercial land in Chicago". Supply is elastic. But demand is much less elastic than before. II:  Altho much of same land is involved. (The inelastic demand indicates rent to residential land in Chicago)

So inelasticity & hence rent is not so much a quality of things as of the way we define the things.

Strange evolution of term "rent". Was a debate. One side wished to alter meaning of a word to sidetrack the issue. ~~Then~~ Many said then simply let them get away w. it.

Bldg's def., p. 211, is very wide.

" . . . any payment to a unit of a factor of production, in an industry in equilibrium, which is in excess of the minimum amount necessary to keep that factor in its present occupation. Although first worked out in connection with the services of land (hence the name -- economic 'rent'), this concept applies to any factor of production which does not have a perfectly elastic supply." How broad can you get? That covers absolutely everything.

The defn is very fuzzy. "Present occupation" is not defined, and how much of the factor has to say in is not said.

Idea of land as fixed probly arose in small nw European countries with lots of international trade and migration. Then with respect to any national policy, e.g. taxes, land was fixed, and labor and capital migratory, as Adam Smith emphasized.

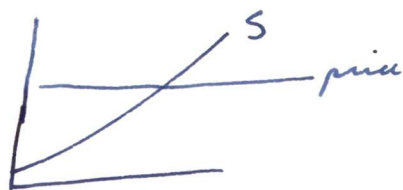
In U.S., with immigration bars, and active land development, we might look at it the other way, re national policies (altho not re local ones.)

Now should we keep the word "rent" for fixed factors, or for land? The fixity was incidental. Land was essential, so let's keep it there.

Micro rents are the lesser part of the anti-land argument, ~~they~~ (except as they create general confusion, which is the greatest contribution)

Tougher one is that labor ~~is~~ as a whole is inelastic. And the whole labor must be less elastic than any part, since the whole has fewer alternatives

Bldg's micro rent e.g. is ~~not~~ not only micro but evanescent, p. 212. Is a short run or quasi-rent only. So are many micro rents, except land. Because only land is permanent. Hence land has a monopoly of long run micro rents. Bes it is the only permanent resource.



Rent as "surplus".

a

They say if paid labor or cap. less, might get just as much.

But if you paid them less, there wd. be more to be distributed in some other way. Either it wd. be wasted on others; or just wasted; or, most

likely, it wd. return to roughly some people — but in diff. way.

Thus they wd. be just as rich, but lower wages, hence work less.

The 'work more' arg. depends entirely on inc. effect.

System of max. incentives. Implicit in "everyone gets rent" argument is idea that payments must be justified by their incentive fn. If so, we wd. seek out elastic supply curves & raise payments there, reduce elsewhere (or tax away).

I once relied on argument there was key difference of kind between land rent & other payments bcs others justified by drawing forth input supply. But this really sets up whole scale of differences, payments are socially justified inversely to slopes of supply curves.

In what sense is land supply responsive to price:

a. Shift among uses. [& if all ^{land} prices rise in proportion, Δ s incentive to shift] Or from non-use to use.

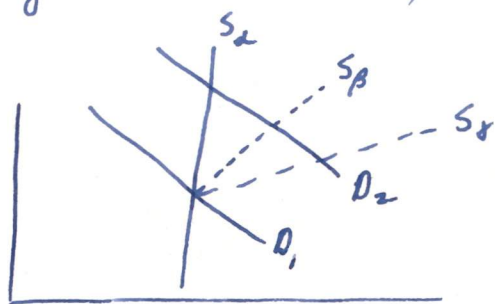
b. If price of land is hi, encourages invmt. of capital, that marvelous flexible stuff, to complement land (in sense of bringing more into mkt); & sub. for it, multi-story bldgs. etc.

(You subst. for the hi-priced central land by complementing it w. many storeys!! An antinomy! And by complementing outer land w. roads etc.) (This is the boom-bust antinomy. Hi land price makes you sub. for land, but that means complementing individ. parcels, leads to higher expectations)

Can't apply tradnl supply curve to land tho, bec. not homogeneous, is not one price but a structure of prices. Take as an index some medium intramgt land, tho. & as ΔP , get Δ s of land as submgt land rises to intramgt.

Thus land supply shd not be repd. as fixed, any more than labor supply is fixed bec. there are so many people. If Δ wage, bring in submgt people, Δ labor supply. Same idea exactly. If Δ i.r., bring in submgt assets as cap., too, probly.

So ~~supply~~ price-elasticity of supply is dubious way to distinguish land (rent) from other resources.



Let demand Δ from D_1 to D_2 . At first price rises. Then slowly land is reallocated to higher uses, & this reallocation is same as Δ in aggreg. supply. It involves new cap. invmts, is $\therefore$ slow.

[Tension, bcs incl. rent is sticky. It should move up immed., then slowly fall. In fact it moves opposite, rises slowly.]

Thus during cycle we move from price below eq., w. non-price rationing, to price above eq., & vacancies.]

It entails sucking cap. for land. One may interpret this either as reduced demand for land as such, or Δ supply thru realloc-n.

Does it matter?

When speak of "supply" of anything we usually mean at some place or places.

"Supply of land" has $\therefore$ a different meaning. You Δ supply of oranges in N.Y. by bringg more there. You Δ supply of land available to a given popn. by spreading them over larger area. That, sense 1, is legit. It involves better cheaper xptn.

Also Δ supply of land by having offered for use land previously held unused. (You cd. also call that reducing demand). This is not Δ g physical supply, but mket supply, & mket supply sets price.

If that be accepted, then also Δ mket supply by letting land move from near-idleness to higher use. Thus better allocation is same as Δ aggreg. supply, in genl.

Thus mket supply changes, in meaningful senses, by dispersing popn; better allocating land. 3d, by Δ g real productivity of land (not by scarcity but better mket position etc.)

Many writers define "rent" as synonymous w. ~~economic~~ "producer surplus." This is unnecessarily throwing away a useful word & concept. To Ricardo "rent" meant the payment for the use of land. The ~~other~~ surplus aspect was one of its traits. Writers who thus use rent, to round out their vocabularies, now owe use another term, to replace the one corrupted.

That Ric. found it nec. to explain rent thus was to answer plausible qn, why shd. anyone pay for that supplied free by nature? Re no other resource is this qn. possible. Is no mystery why you must pay men to work, and to sink funds ~~see or disband~~ create productive capital

I use "ec. rent of land."

Many ecsts very ~~to~~ careless in dist. xfr rent from aggr. rent
~~Meyers e.g.~~

Meyers speaks of inc. above opp. price as "ec. rent w-in the industry," later "intra-industrial rent."

Rent is simply the payment made for use of land. Payer will pay up to mp.

Use of mp concept is discouraged bcs land comes in units of fixed sizes. But one can originally choose among many units, various sizes. And can add to edges — but in a most imperfect mkt. Bcs of such imperfections, tend to treat land as residual, thus grows up tradition of rent as surplus, differential, etc.

Turnover of capital, get that in.

High-universal problem, since all human activity takes place on land, land claims portion of all gross outputs.

Exhaustibles, def. of rent.

2 dry lens.

Nature of dim. rets (or is that production ex?) Crowding.

False issues by the zillions. It doesn't matter what call it. Nor does it matter whether you tax land rent or labor wages, what matters is how you tax them.

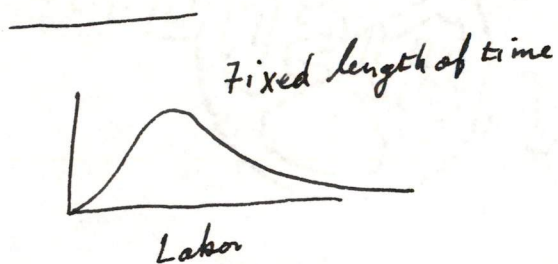
So idea of rent as a surplus has no particular bearing on land.

This has been a red herring.

We speak of price - and income - elasticity. I suggest now tax - elasticity. Is not same as simple ΔP . And varies w. ^{mode} ~~mode~~ of levy.

Turnover & replacement policy, very relevant.

Capitalism & allocn.



Dim. returns, conc. labor in time, just as in space.

Thanks to H & SPE.

It is Ricardo, not George, who speaks of "original & indestructible" powers of soil. H & SPE, p. 408. "the whole external world accessible to man". Is passive. "... land cannot act; it can only be acted upon. Man alone is the actor." This is a point I missed in my thesis. Is it valid & important?

Chide idea that landholders, by fencing land, contribute to production. Find quotes.

Critic says you cannot judge
mp of land by one year's condition,
w. old improvements, must rather
judge cycle as whole.

I reply age of improvements &
current net rent gives very
accurate info. To holder, mp of
land is now below current net
rent. Regardless of what he may have
gotten in past.

Implications of cap. substituting for land.

W-515 Resources

For classroom use only.

On the Theory of Resource Use

Professor Edward S. Mason
Graduate School of Public Administration
Harvard University
Cambridge 38, Massachusetts

Dear Professor Mason:

I enjoyed reading your paper entitled, "The Political Economy of Resource Use," which appears in Perspectives on Conservation edited by Henry Jarrett. In my opinion your analysis is most helpful and very well taken. However, I would like to discuss with you several issues raised in the latter part of the paper in order to get my own thinking straightened out.

First, it is not clear to me what you mean by "Any diminution in the resource base involves a potential reduction in output overall" (p. 184). It would be helpful if you could elaborate a bit on the reasoning here. My first reaction is that the problem (from the standpoint of society) is not so much a concern with our natural resource base as it is with our total capital base. I have thought (perhaps in error) that natural resources per se are only part of our total social capital and that there is no a priori reason for believing that natural resource capital is any more productive than other kinds of capital. According to this line of reasoning (aside from the problems of imperfections in the capital market, ignorance, common usage, external economies, and diseconomies, etc.) a decline in the resource base may be offset by an increase in other types of capital. Should our attention be focused on natural resources as such, or should it be concerned with the maintenance and expansion of our total capital base? From this point of view, it is true that a diminution of our social capital may mean a reduction in total output, but the emphasis is directed to the overall problems of consumption, savings and investment rather than to natural resources as such.

Second, I have some trouble in understanding the logic of the suggestion (p. 185) that the appropriate rate of discount for valuation of investment in land resources may be zero. As I indicated above, I find it difficult to visualize reasons why land investment per se (apart from the special problems of commonality, etc.) should be accorded different treatment than other kinds of investment. Evidently, I am in error, but it appears to me that society can provide greater provision for the future by increasing the amount of investment it is currently making, but for any given amount of investment (saving) it would seem that the proper rate of discount would be one which measures the productivity of capital at the margin. Does not efficiency dictate that investment should not be undertaken unless it can provide greater returns than alternatives sacrificed? This would seem to follow regardless of whether the total amount of investment is determined by consumer sovereignty or by centralized planning. Such a criterion would then make it possible to evaluate social goals and other intangibles (associated with investment) on their own merits.

Have I interpreted you correctly?

Thank you for your consideration.

Sincerely yours,

J. W. Milliman
Assistant Professor
of Agricultural Economics

!!! When?

Professor J. W. Milliman
Department of Agricultural Economics
405 Hilgard Avenue
Los Angeles 24, California

Dear Professor Milliman:

I will try to reply as best I can to the points made in your letter of May 7. The first, concerning the statement "Any diminution in the resource base involves a potential reduction in output overall," should give us no difficulty if we lay proper emphasis on the meaning of potential. Any reduction in the society's stock of capital including the resource base involves a potential reduction in output. Assuming that other resources are substitutable for land or water, a reduction in the resource base could--but it does not need to be--be overcome by appropriate measures concerning other elements in the stock of capital.

Your second point is more bothersome, and I must confess that this question of whether the resource base of a country belongs in a special category of social capital has bothered me a lot ever since I first began to think seriously about it at the time of the Paley Commission report. The argument in favor of treating land, water, and possibly energy resources as a special category depends, I think, on two considerations: The first has to do with substitutability. If capital is easily substituted for land and water resources, the first argument falls to the ground. It seems to me, however, that beyond a certain point substitution becomes prohibitively costly. The second argument has to do with the risk factor involved in projected requirements for land and water use. Any projection of future requirements, future sources of supply, and possibilities of substitution inevitably involve large elements of uncertainty. In the case of the resource base, serious mistakes of estimation may have irreparable consequences which I don't think are likely to attend mistakes of comparable size concerning other elements of social capital. Insofar as this is, it argues for a special premium on the preservation of these particular kinds of social capital.

As I read your letter, the underlying assumption in your argument is

? ✓
*But under-
estimates are
the more
common
error.*

that various forms of social capital are and will continue to be easily substitutable for each other. This may or may not be so.

Sincerely yours,

Edward S. Mason

Professor Edward S. Mason
Department of Economics
Harvard University
Cambridge 38, Massachusetts

Dear Professor Mason:

Thank you for your letter of May 12. It appears that we are in agreement concerning the first of my two questions. In regard to the second question it is possible that a continued discussion of the matter may prove fruitful.

As I understand your reasoning, you feel that natural resources might (should?) be placed in a special category of social capital for two reasons: factors concerning substitutability and factors relating to risk and uncertainty. I would like to talk to each of these points, although I am not really certain of the validity of my thinking here.

In reference to the matter of the ease of substitution of various forms of social capital for each other, it seems helpful to admit that there are problems of substitutability between various kinds of social capital, but it is difficult for me to see just how this really constitutes an argument for special treatment of natural resources. First of all, it is not a question of "all or none" but a question of a little more versus a little less. In other words, we are concerned with marginal adjustments, i.e., the marginal rate of substitution. And at the margin it is doubtful if the difficulties of substitution are of special concern. Second, the fact that the cost of substitution increases the farther it is pushed is true for all kinds of capital inputs and does not appear to be a special attribute of natural resource capital; that is to say, "beyond a certain point substitution becomes prohibitively costly" for all capital inputs. Third, it seems likely that the productivity of capital at the margin will tend to reflect the relative difficulties of substitution of all kinds of capital for each other and that conceptually it is possible to say that cost of substitution has already been taken into account.

Of course there may be special problems of imperfection in the functioning of capital markets and particularly this may be true of natural resource markets. For example, I have argued in another paper that water law

tends to hinder the transfer of water resources between competing uses and many other similar institutional and technological roadblocks can be cited. Proper policy here would seem to call for attempts to mitigate the imperfections directly, but it does not seem to call for a special capital theory for natural resources per se. In other words, the rate of productivity of resources at the margin may not be optimum, but it still reflects the current opportunity cost of capital. And to neglect the opportunity cost of capital when one is concerned with investment policy for natural resources seems to me to be incorrect.

✓ In regard to the problem of risk and/or uncertainty in the use of natural resource capital, it is difficult for me to understand why risk and uncertainty may be any greater here than they are in the case of general capital investment. Risk and uncertainty are pervasive, but we never just suddenly jump from 1960 to the year 2020 so that we can continually alter our decisions (at the margin) in the light of changed expectations and new information. This is not to say that the market as it presently functions is optimum, but the logic of the case still holds.

✓ At this point the usual reply is that natural resources are different because certain actions are irreversible or irreparable. Again it seems to me to be valid to point out that we are not making "all or none" decisions but marginal adjustments. Second, it might be asserted that irreversibility is not a problem that is peculiar to natural resource use alone. *Hardly. Land layout, e.g., is very hard to reverse because land lasts forever. But*

Third, in so far as risk and uncertainty are present, what reason is there to believe that the opportunity cost of capital at the margin does not (at least ideally) reflect these factors? And fourth, if there is good reason to believe that the market is incapable of reflecting the "true" risk in the use of natural resource capital, it seems preferable to me that the decision-maker make the proper allowances in the estimation of the cost and benefit streams rather than in the rate of discount itself. That is to say, it seems more desirable to inflate the anticipated future benefits of resource investment (if one wants to accord special treatment for these types of projects) rather than to reduce the rate of discount. The problem here is to deal with the risk per se and not to influence the decision between alternatives having different time streams by applying a special rate of discount. Projects with long-time streams will be favored by low discount rates and (if the risk factor has already been taken into account) they are not necessarily superior to projects with shorter time streams. This point would seem to hold for alternatives which are all natural resource projects as well as in the comparison of natural resource investment versus investment in general.

Sincerely yours,

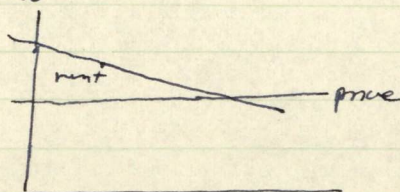
J. W. Milliman
Assistant Professor
of Agricultural Economics

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Rent.

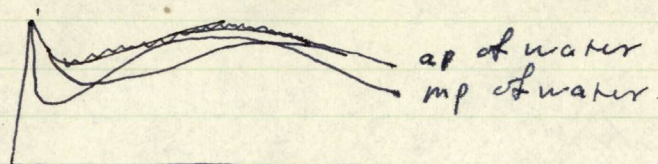
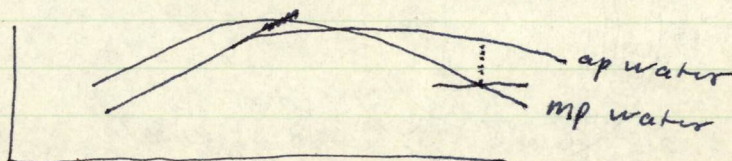
from demand side



difference of ap of other factors from their mp & hence price.

Cons. surplus analogue.

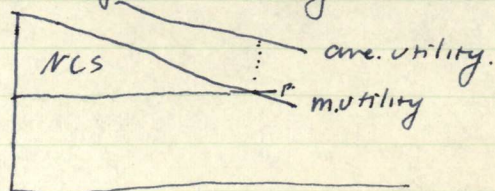
Coord. with rent from supply side.



Difference of mp & ap isn't nec. rent. Is returns to all other factors. Whether it is rent depends on supply conditions of other factors. When we draw above curves we assume other factors supply is indep. of amt of ~~the~~ water, (hence of their mps & returns) so it is all rent. But a realistic mutatis mutandis mp curve would show mp as it would be given supply c. of other factors.

If we draw m.m. mp curve, it falls less fast, difference of it & ap is less, & represents pure rent, again. - to all other factors. (The maybe with lab & cap. it depends on whether other costs are pec. or real)

Whenever get a falling demand curve, must get this.

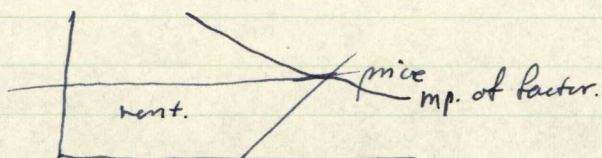


'Consumer surplus' would not be NCS, but diff. of marg. & ave. utility. ? Aren't they = ?

If mu means the Δ to t.u., This is inescapable.

rent, 2.

From supply side, rent goes to the factor with inel. supply.



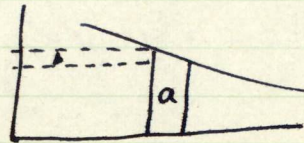
Note that any factor with a de facto, or m.m., falling mp curve, ~~gives~~ ^{gives} rent. If a supply of factor was always matched by a supply of complements, they would get no 'rent', - so complementarity $\rightarrow$ rent when thing complemented is of inel. supply. Micro-ec., & esp. regionally, only land's supply is inelastic. Macro ec, ~~these~~ ^{these} many labor & cap. may be less elastic in long run, certainly even in short. than they are micro-ec.

That labor & cap. should get rent, macro-ec, is 'assuming full empl.'

It is socially desirable of course that labor & cap. should get rent. For all this means is they are getting more than subsistence.

If are figuring up of factors hired this way, consider their mp elsewhere as > price, too. If I had est. any ~~that~~ $mr > ar$ from demand curve alone it would have been equally applicable elsewhere - tho varying with e . But main item is incidental complementarity, not shown on curve, from general social development, etc.

The rents created do not nec. go to those whose lands get water, since their Δ prod. may lower p , esp. in Cal. specialty crops. Hence incorrect to seek'em for it automatically.

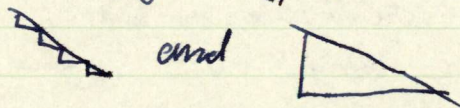


'a' is mr , insofar as it is price collected shown here. It is possible that this is entire mr , & benefits to other lands may just be stolen from it. The lower p . - I don't know.

As far as this alone goes, no mr curve above price curve. Mr is just pq . For any finite q is area 'a'. This is marg. social revenue. If we just let him compensate self for 'b' by Δ tax, would get less than 'a' as mr . So for every finite Δ product do not figure mr as the new price $\times \Delta q$, but $\int_0^q p q dq$ - i.e. 'a'.

This is good for very small Δ s, too, but the smaller they get the smaller the price Δ , & the closer $p q \rightarrow \int_0^q p q dq$.

The larger the unit Δq in question, the more will allocation be wrong, if $\int_0^q p q dq - p_2 q_2$ is not collected as tax. Difference of



With water, This comes up twice: a) when deciding how much to expand; b) & how much to tax as water varies naturally.

a) figure as prob. comp. world, for small units. For large, figure whole $\int$ as your mr , & collect it. & figure more, too, Δ s other than those shown under water demand curve.

Your Δ tax as you expanded would be automatic. Knowing your demand schedule, knowing how much you are reducing p , you know value of area Δ , increase tax that amount.

You may know demand schedules of individual lands well enough to adjust their taxes from them. But people, knowing this, would change their schedules.

Let anyone change his at any time, for best allocation, & despite loss of a tax assessment aid.

b) As water increases by nature for lower price, increase tax.

Now, will that ID pay us for extra water? They won't pay more than mp. The rest they take as rent, or leave to landowners.

a) With small Δq , the rent calculation will make little appreciable difference - but when you add up all the small ones it does.

& esp. when a big decision must be made, important to figure it in. Tells you how far to go, too.

Cannot get $mr > ar$ from demand curve. Can just keep it from being smaller. To offset monop. calculation, add B, as well as A, to mr, just subtract A. Leaving $B + C + Z$ as net mr.

Proof that monop. calculation re A cannot be extended to social re B & put $mr > ar$. Take a finite Δq . Monop. figures net revenue, spreads it evenly among all units, & gets for each something below ar. - because for the whole, $mr < ar$. Social calculation, finite $mr = ar$ curve, being $B + C$. Spread it out, $mr = price$.

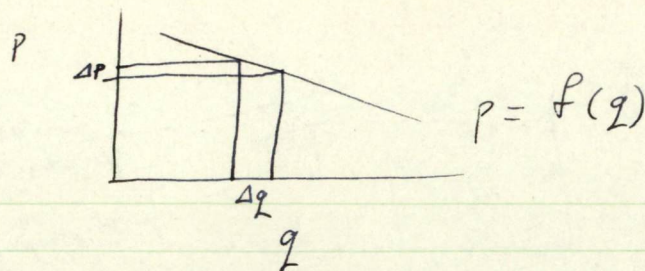
So no ID will sell water ~~whose price~~ for less than its cost. Nor should it, (same for Z - & it would, then, if it collected Z, which it might not)

So CVP cannot get rents by selling to IDs at high prices - save by some discrim. Yet CVP creates them, so it, not IDs, must collect them.

How affect allocation? ^{as c.f. to comp. or monop.} 1) Offset monop calc. 2) for large units, get B where comp. would not. 3) Consider Z

Rent will go to the complemented factor with inelastic supply: land, locally. Maybe labor & cap. small economy.

No ec. reason for changing Δ equilibrium price. Must ration then; increases rents, not incentives. Cost allocation just excuse for so doing, has no real usefulness.



monop. {

$$mr = \sum p \Delta q$$

$$mr = \frac{dr}{dq} ; r = pq = q f(q)$$

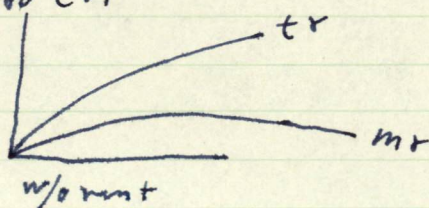
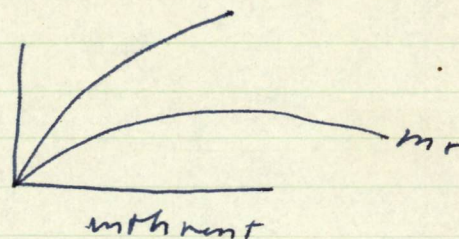
$$mr = \frac{d(q f(q))}{dq} = q \frac{dp}{dq} + p \frac{dq}{dq} = q \frac{dp}{dq} + p = p + \frac{p}{e}$$

CVP, knowing it will get rents, won't produce any more than competitive world. Only thing creating rents on marginal output is knowledge that price will fall. Comp. doesn't know that. CVP not troubled by it, for fall in price of existing output compensated, also fall in price of marginal output - but no extra

So collecting rents doesn't increase output???

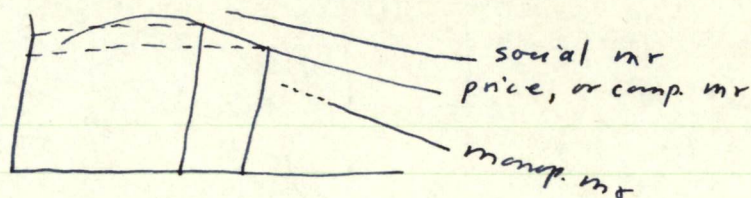
If it were something you couldn't change for, certainly collecting rent would increase mr. It would be entire mr. But as you can change for water, different.

We will have CVP getting more tr by taking rents. Every Δ water sales increases rents as well as other revenue. Mr is $\therefore$ greater, so CVP

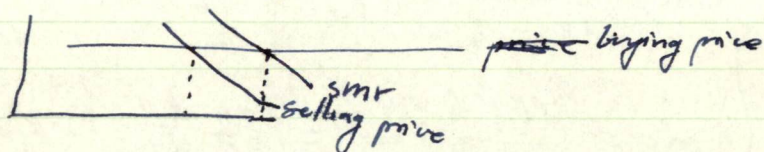


The mr w/o rent is competitive mr (by our ~~top~~ orders). Thus overstating tr.

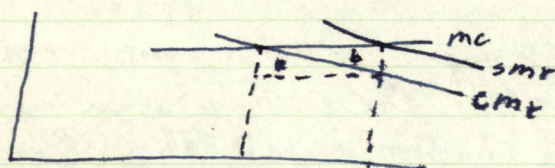
Social mr.



An ID following smr would buy more water, so:



Analyze extra purchase:



How can ID collect smr? Or, alternatively, if CVP collects it, how will it cause more output? $smr = mc$ where $a = b$?
 i.e., where amt gained by rent^(a) = amt lost by paying more for water than its mp.

"Fn. of landlord" idea now
revolves around bearing cap. cost.

Used to rest on rent, need someone
to allocate land.

Other incomes, human does something, $\therefore$
gets paid

Land rent, land gets paid, $\therefore$ people
do something to get it.