Econ. 117, Planning

10-14-62

Now nearly finished math. ~~Remaining topics:~~

Review accomplishments. Congratulate ourselves

Compounding & discount; intertemporal rates of exchange

Summation & valuation
annualization – sinking fund & cap. recovery
Imputation – land share const. over time

~~Sinking fund & cap. recovery~~

Capitalization; tax capitaliza

Interest-elasticity of demand for ~~land~~ assets of varying durability
Implications – some of the most fascinating in econ. Effect of
i on c.f.

Near future topics

Effect of i on factor proportions
[Define 'cap. input' as $c = C_0 \frac{i}{1-(1+i)^{-n}}$ ~~Justify~~ Justify graphically, Σ inputs > $C_0$]
a. as among individs
b. Effect on whole economy

Effect of i on turnover of a nation's capl.
[Can Δ propn. of cap. by Δg c.f., w/o Δg cap.]
On durability (M. Bailey)
Effect of i on future rents, thence on demolition – [here, lo i has good effect, take that into account!]

Risk
Land: def., properties

Rent
Etc.

# 117a, Outline

1. Description of course procedures;
   Philosophy of emphasis knowledge w. low rate of obsolescence
   Civic leadership, prepare her. Imbue pride in. (Highet?;
   come to conclusions, be decisive, but leave room for open minds new exploration.
   Begin by preparing for analysis } Explore frontiers -- disciplines in flux
   Problems in being scientific re econ.

2. Survey course subject matter.
   Sell it. Fills gaps left by other subdisciplines. Fills empty boxes of theory.

3. Math. of finance. (Course Roy Thomson, largely) (assign Books of Tables, or have them buy a cheap one) w. problems to solve)
   a. Compounding & discount. Intertemporal rates of exchange
      Rationale of discounting futures, and arguments vs. it.
   b. Annualization (RGD Allen? Lutz? Babcock? Engineering Economy?
   c. Sinking funds and amortization (accounting books) (Stigler?)
      (utility doctg. practice -- ask Eric)
   d. Valuation; interest-elasticity
   e. Valuation & replacement policy. (It depends on replacement schedule, & is means to determine it.) Thomson, pp. 59-79, "Ec. Anal."; refutes max. gross yield, & forest rent doctrines
   ~~f.~~ f. Effect of i on structure of prodn, or durability (M. Bailey)
   g. Effect of i on factor proportions. Def. of capl. input

4. Land: defn., & unique properties as con ec. resource. (h. Taxes in matn. of force.
   Capital, which turns. (J.B. Clark, Bohm-Bawerk, Knight, Hayek, on capital's nature)
   "Substn." is intensification
   Measmt. Area units; value unit, standard cadastral module, scm.

5. Rent
   Def.
   Distinguish from other incomes
      Wages. (Soode, Robbins, supply-elast. in terms of effort)
      Interest (Keynes, supplied free)
      Profit -- a true residual, thy. & practice. Shock-absorption, requires a fund.
   Imputation of rent.
      Euler's theorem. Static =n, can exhaust product
      More usable ... treat profit as residual, rent is future o.c.

117a Outline

Ch. 5. (cont.)

Refinements of rent

ave. & mgnl. for whole, integral firm - w. intra monadic homogeneity (& homogeneous atoms)

~~Organic unit, whole or integral, etc.~~ Subrents, w-in monads (atoms, or firms) (or discrete replacements, in time, hence use monad instead of firm, or atom)

in time: time-ave. vs chrono. mgnl.

in space: space-ave. vs. geo-mgnl.

Atomistic vs. integral, large-scale ec. rents

~~Fns. of rent~~

See F. Miller paper for more

Rent & soil exhaustion; rent & mines

Potential vs. kinetic (only potential is correct, kinetic is common fallacy.)

Steady rent, or time-ave., vs. risk-sharing rent. (assign Yellow & Blue Bks as risk?)

Fns. of rent

To create land? No. but help guide p.w. Foretaste of B-C anal.

Allocate land

Constrain holders not to waste

Constrain extension in space. To qmgl; in central places.

" " time

" " of scale.

Rent as adjuster of factor proportions, or intensity. Encourages intensity.... (define cap-intensity as qmgs i.g.)

Amount of rent. Cpts w. a. l.v. by Kalmus, Gaffney. (Rent and taxes)

6. Obstacles to effective functioning of rent

Xptn rates, unec.

Time-indivisibility

Bilateral mnpy in assembly - x/bs. Immobility

Non-collection of ∆ l.v. by creators ... separation of benefits from creators

Pol. structure. Use of rent to distrib. favors.

Fiscal profit-sharing. Taxes on cap. & turnover

7. Policies to overcome obstacles

Heavier land taxation; lighter other taxation

8. Land ecs. & planning of p.w. (B-C anal., rich lit. This finishes semester.) (Blue Book as text ∴ possible) (Leads into macro-econ, 117b)

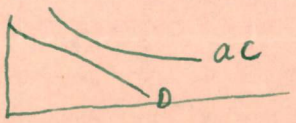
This will carry me thru Sept. & Oct. So let that be enough for now. Org. 2d ½ of sem. after finish Meenes paper. & 2 research applies.

Cleveland. Questions for a MS oral, etc.

✓ 1. argument for subsidy to decr. cost opn.

✓ 2. choice between ~~water &~~ indiv. & public wtr supply, if D curve crosses MC curve twice.

3. How far extend a city water main?




4. ~~Reversal~~ — when?

5, Wtr law

✓ 6. Elast. of demand for. of slope?

7 = mgnl allocation of capl?

✓ 8. Price control ever good? Min. wage law?

9 = n of exchange

✓ 10. Balance of payments, growing region

✓ 11. Sensitivity to i.r.

117a, RBR assignments

Not agree w. all assignments
Clashing viewpoints
Frontiers of research.

get from J. Monroe, Kent.

Scan file for others.

1. Procedures, philosophy, etc. ~~Highet~~? Attacks on pedantry; inspirational essays. George, The Study of P.E. Robertson? L. Robbins? Bergen Evans. Emperor's new clothes. anti-textbook articles ... Aplanta, Sat. Rev, etc. Incentives to get thru math. J. Swift? H.L. Mencken? Voltaire?

2. Survey course. [ Clapham on Empty Boxes? Gaffney on urban expansion. Touches on many major course topics. Discuss them, & also remind it doesn't touch on.

3. Math. of finc. (Books of tables; assign problems.) ~~(K&M has both text, tables, & problems.)~~ ~~(Ray Thompson)~~

a. Compound & discount.
Technique. K&M, arts 8-12; R. Thomson, p. 91, forms. 1 & 2; pp. 53-56; Keynes, ch. 11, mec
Intertempl. exchange. ? Fisher? ~~Lee~~?
Pro & con? Intro. only. Much of that must wait until later) Stackman. Pigou, Keynes, Econ. of Welfare, Int. as maxg growth of cap. ch. 24, vs. int.
Int. & ec. growth? — Yellow Book, II

b. Annualization
Technique. K&M, 17-20; 24-25;

Questions of imputation ... which input gets the const. flow of income? Land, labor, & residual imputed to profit
~~Lutz & Lutz~~

✓ Factor proportions ... def. of cap. input, static & dynamic.

c. Sinkg funds & am-n. & depreen.
Technique. K&M, arts 33-43 (am-n.)
arts 61-66 (Depreen.)

Def. of income. Stigler. ~~L&L~~. Utility & acctg bks.
L&L, p. 228 esp, pp. 224-230
BB., c.p. 159, on Cap. Recon. Factor

c½. I.r. & Invmt Effic. BB, chap. 7

d. Valuation
Techniques. Bonbright. Babcock.
Differential interest - "elasticity" of values. (Have more sheets mimeod to pass out.)

✓ I.r. and factor proportions. Micro & macro.
where site is fixed, so i.r. means more cap. (static at least Kr. Econ., ch. 5)
where " " expandable, " " less ", " & dynamic: pp. 59-79, 21-31, 49-52, 53-58
e. Valuation & replacement policy. R. Thomson, (Also reviews all above.)
Simul. determination necy. L&L., ch. 2, pp. 16-48. Covers all.
Appreig assets Gaffney, Encl Mat.
Depreig "

BB.

✓ f. Replmt policy, cap. turnover, cap. intensity, durability, structure of prodn. Effects on emplmt. (Foreclosure ⅔ (17b)
Hayek, on turnover = sales/cap. Wicksell, pp. 172 ff. (?)

117a, RBR assignments.

3. g. Effect of i on factor proportions. M. Bailey (Review of 2 topics already treated)

Def. of capl. input.

h. Taxes in math. of fnce

i. T.r. & ec. growth.

j. arguments vs. use of int. Keynes, Hesell, Marx, Pigou, foresters, Scholastics, Staehner, monument-builders gnrly, emphasizers of scale-economies, landholders.

4. Land: def., & unique properties.

No turnover. Ectoplasmic capl. of Clark & Knight & Stigler which never turns over, either.

Leg. on Depreciation

Terborgh, George, REALISTIC DEPRECIATION POLICY. Chicago, 1954

E. L. Grant and Paul T. Norton, Jr., DEPRECIATION. N.Y: 1949

Ec. 117, Week of Oct. 8

Mon. Go over BB ch.

W, F. assign Keynes, 11, 24

Next. Factor proportions. How ↓ acts to spread cap. around. (M. Bailey?)

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

$$i\left[(c+s)(1+i)^{n} - s\right]$$

$$\frac{\Delta g}{g-c} = \frac{i}{1-(1+i)^{-n}} \stackrel{?}{=} \frac{\Delta u}{u}$$

$$u = (c+s)(1+i)^{n} - s$$

$$\Delta u = i(c+s)(1+i)^{n}$$

$$\frac{\Delta u}{u} = \frac{i(c+s)(1+i)^{n}}{(c+s)(1+i)^{n} - s}$$

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

Clemens.

own separate account. Thus the appealing simplicity of the method is lost. For to justify keep'g the undepreciated Co, we must not report building up cap. elsewhere in the co., else we overstate the cap. (maybe that is what utilities like about it.)

In landscapes, we don't need to break down C into income & depreen., bec neither is land inc. But to determine income, for taxes or rate-making, it is necessary.

Clemens' treatment is not profound. But Erich says it is better than most.

Bonbright, J.C., Prince of PU Rates, '61

p. 206, says ~~straight line~~ sinking-fund once was favored by many commissions, but not so much now, strt. line is more favored.

p. 196, n. 7. In '20s, some writers postulated plant immortality, rejected any depreciation charge. Recent writers deem that unworthy even of discussion.

Both Bonbright & Clemens make clear that subject is pretty fuzzy, & people are just beginning to think it through.

Don't assign either one for ecs 117. Too much extraneous stuff. Try to summarize for lecture.

Clemens, E. W. Eqs & Plts NY: Appleton-Century-Crofts, Inc., 1950

Sinking fund annuity, $a = C_o \frac{i}{(1+i)^t - 1}$, returns initial $C_o$, but no interest

It is inelegant, since $C_o$ is treated as tho it were like $C_t$.

Cap. recovery factor, $c = C_o \frac{i(1+i)^t}{(1+i)^t - 1}$, returns $C_o$ + interest. It measures the full & true capital input, from $C_o$ alone, [w/o reinvesting $c_i$ in the business — that is a separate matter.]

$a < \frac{C_o}{t}$

$c > \frac{C_o}{t}$. When $i = 0$, $c = \frac{C_o}{t}$

If we call $\underline{a}$ "depreciation", some adjustment is needed. Since $\underline{a}$ replaces $C_o$, at $\underline{t}$, the difference above $\underline{a}$ is interest on a $C_o$ treated as tho not depreciating. Annual charges of $(\underline{a} + C_o i)$ are same as $\underline{c}$. Test that.

$$C_o \frac{i(1+i)^t}{(1+i)^t - 1} \stackrel{?}{=} C_o \left[ \frac{i + i[(1+i)^t - 1]}{(1+i)^t - 1} \right] = C_o \frac{i(1+i)^t}{(1+i)^t - 1}$$ Yes.

$$c = a + C_o i$$

So Clemens is right, p. 205, saying that "if sinking-fund method is used in computing depreciation, the utility shd. be allowed an un-depreciated rate base." That is same as using cap. recovery factor. Utility is allowed to call both of these costs, each year. Is perhaps the easiest way to keep books. Also, investors probly want return on $C_o$, and mntnce of cap. so this method also separates what you pay to them & what you reinvest in the business, to maintain capl.

Then, at $\underline{t}$, capl. has ben. maintained. $C_o i$ is shifted over to the new assets — it must cut off entirely on the initial one. That cd. get complex, as the $s have ben reinvested in many pieces of equipment, each of which has its

Land Economics, Topics, Course Ec. 117.

0. General pep talk?
1. Survey
   Relation to other fields in econ.
   Value of discipline for pvt. & public decision
1½. Def. of land. Unique properties as an ec. resource. Msrmt or quantification ... by area, annual value, cap. value.
   Land vs. capl. Turning of capl. (Clark & Bohm-Bawerk; Knight & Hayek
2. Land cycles. (2d sem?) Valuation ... Babcock? Benbrighit?
3. Math. of time, or finance (Kuhn & Morris?) (Roy Thomson? Forestry text?
   Fncl. maturity? Martin Bailey? Babcock?
4. Replacement policy (Fncl. Mat.; Fisher; Allen; Bldg; Lutz; Ratcliffe; Winder & Trant vs. Faris;) & rent.
5. Imputation of rent. (Samuelson; Stigler; new intermed. texts on distribn. thy.)
6. Land rent vs. other meanings (Bye; Buchanan
7. Kinds of land rent: ave., mgnl.
   Whole-unit vs particularized
   atomistic vs. ~~holed~~ large-scale
   Kinetic vs. potential
   Steady vs. periodic, or variable. (Commodity; risk; profit; etc.)
8. Rent as constraint on ~~use~~ extension in space. (Intensity, factor proportions.)
9. Rent & soil depletion. (Commons; L.C. Gray? Etc. – see USDA Biblio.)
   cf. 35, i.r. & comm.
10. Rent & mines (Herfindahl? ...
    Opt. rate of depletion.
    Δs to value of fund resources. (Distinct from Δ s.v. of flow rent) (Δ to value of unit of ore is normal even w. constr. inlet. value)
11. Rent as constraint on imposition of traversal costs (Billington, Paul Gates, Buttenheim, anti-scatter literature.
~~12. extension in time~~
    .. economies of scale.
13. .. extension in time (same as replacement
14. policy?) #4)

✓ 15. Rent as guide to planning p.w.

16. "Efficiency" & opt. combo. of res. (Stigler. Boulding?)

17. Rent & l.v. Indivisibility in time. ~~("Unwieldy Time-dim."~~ (Schultz)

17a. Capl. mkts, barriers to flow.
17b. Transp. discgs.
18. Malallocation due to ↑ "Unwieldy time-dim."

19. Concn. (M.J. Bowman? Lampman? Distr. of domain. "Justice in Distr."

20. Regression fallacy (put Waugh on reserve) for this week & progressive taxation ~~for this week~~.

21. Taxes & malallocation

22. Developing land, pricing p.w., decr. cost. (Hotelling, Putnam?, Ellis & Fellner?, Koplin in LE, Illinoisian vs. mc pric'g, etc.)

23. Rent as trag for external ecs, cons. surplus, etc.
JMD Little? Hirshl. etc., on consumer psycho analysis.

24. Macro-econ. (2d semester?)
Solo

25. Scalloped ~~supply demand~~ curves,

26. Lbry benefits. Hirshleifer etc.

27. Ricardian Cameralism.

28. Land as a tax base

29. Cap. fmtn. & ~~turnover~~. land
29a. Cap. turnover.
30. Factor proportion, relative prices, and adjustment (automatic)ness to full emplmt. via price adjustments.

31. Land & devmt. & ec. devmt.

32. Benefit-cost anal. (cf. 15)(22) etc.

33. Water systems, optimal

34. Risk, insurance, variability, profits, etc. (cf. imputation.)

35. T. r. & conservation (L.C. Gray; Wantrup; Hotelling; Pigou. 2 new books on Cap Thy, by Smith, & ed. by Lutz.

36. Location thy.

37. Valuation & forecasting — both are forward-looking, not backward. " based on potential, not current use.

38. Rationale of discounting ..... moving benefits for future years, not robbing them.
Keep time moving.

39. Distrib. organisms, networks. (perhaps part of location econ.)
Variability, line capac., & value of central storage &/or prodn'l capac.

40. Fund, flow, flowing funds, biological res.
Timeless vs. ~~and~~ discounted value of funds

41. Mgnl firm vs. mgnl land ideas.

42. Elast. of prodn, $\frac{\%\Delta \text{output}}{\%\Delta \text{input}} = \frac{MP}{AP}$ Cf. Euler. Use in imputation.

43. Mkt. impact of land reclamation. Displacement of competitors & project evaluation. Meso-supply curve area, argument pro. Timing, etc., cobweb, argument con.

44. Land in ec. devmt? Probly 11 7 b

45. Last session, or next to last, outline 2d semester work on macro ec.

46. Current topics? Ag surp's; recrnl. devmt.

47. Suboptimization vs. coordination. Supercession of lower by higher distrib. organisms (or networks). (Cf. scalloped supply curve.)
Relate to metrop. coordn; intl. relations; world govt. (or U.N.) by way of intl. water problems.

48. What is correct $\underline{i}$ for long discounts?

~~Probably~~ [Perhaps lower than current $\underline{i}$, bcs no need to re-administer loan each yeen or so.]

49. If individs w. lo $\underline{i}$ conserve less, does it also follow society conserves less at lo $\underline{i}$? Bcs. of higher l.v., they don't sub. land for cap., & so probly do conserve more.

Ec. 117, 11-12-62 Review

Major Topics

1. Compound'g & discount
2. Summation & valuation. Memorize one =n, derive all others
3. Annuities: sinkg fund & cap. recovery
4. Imputation
   Land share const. over time
   Meaning of factor propns; relation to durability
   Break down final product into component inputs
5. Capn.; tax capn.
6. Contrasting interest - sensitivity of p.v., goods of varying durability
7. Elasticity of r. of r. to -ΔC, assets of varying durability
8. C.f. of nation's cap. stock, related to c.f. & emplmt.
9. Renewal freq. of sites, slower than cap. c.f.
   Renewal necy. alternative to migration.
10. Fncl. maturity
    Forest rent vs. soil rent. Simpler for depreg bldgs.
11. Uncovered value
12. Effect of i on factor propns: reduces, in this order, durable capl. elements, all land, hi c.p. capl. Land not divisible in time, so on balance use less.
13. I.q.; net & gross.
    Falls as c.f. gets lower, bes. Co applied less often
14. Differential capn.
15. Taxation as solution to problem of diffl. ~~tax~~ capn.

Review problems for study

1. Compute int. elast. of p.v. at $m = 1$ & $m = 40$, at 5%,
   knowing $1.05^{20} =$ ____
   Explain signif.
✓ 2. Remind me what I guaranteed wd. be on exam.
3. Explain effect of $\Delta i$ on factor propn.
4. Why is tax rate same as $i$? What circumstances warrant it?
5. ~~Why~~ Do $\Delta i$ & $\Delta c$ affect bldg. values the same? Site values?
6. Explain tax capn.
7. Relate cap. recov. = n & sinkg fund = n. & valuation = n.
8. Why is p.v. . . . ?