

a2j Speech, NC, 3-57

Graph egg separately.

Analogy of audience as trees
& room as land.

Max $\frac{g}{(1+i)^t}$ is not max S_e

bes are deferring future $\frac{g}{(1+i)^2}$ etc. etc.

also, take no acc't of costs

THE
6TH

World Offshore

CONVENTION



The Conrad International Hotel, Dublin, Ireland
17 & 18 February 1999

THE 6TH World



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CONVENTION



The Conrad International Hotel,
Dublin, Ireland, 17 & 18 February 1999

Programme

Tuesday 16th February 1999

9am - 6.30pm Convention registration

6.30pm Welcoming reception

Wednesday 17th February 1999

Convention Chairman: Peter O'Dwyer,
PricewaterhouseCoopers, Dublin

8.00 - 8.45am Continental breakfast

8.45am Convention commences
*Welcome address - Peter O'Dwyer,
PricewaterhouseCoopers, Dublin*

9.00am *Why Offshore Life for Tax Planning?*
*Alan Morgan-Moodie, Scottish Provident
International, Isle of Man*

9.30am *Tax Planning: The Renumeration of
International Executives*
Jim Stidham, PricewaterhouseCoopers, London

10.00am Questions & discussion session

10.15am Morning coffee

10.45am *Use of Trusts in Irish Tax Planning*
John Hickson, A&L Goodbody Solicitors, Dublin

11.15am *The Euro: Next Steps and
Offshore Implications*
*Peter Price Hon. MEP, European Strategy
Counsel, UK*

11.45am Questions & discussion session

12.00pm Lunch

2.00pm *Response to the OECD Report*
*Professor Mason Gaffney, University of
California - Riverside, USA*

3.00pm *Discussion: Regulation in the
Post-Edwards World*

3.30pm Questions & discussion session

3.45pm Afternoon tea

4.15pm *Cross-border Charitable Giving*
Richard Cassell, Bryan Cave LLP, London

4.45pm Questions & discussion session

7.00pm All delegates are invited to a
champagne reception

Thursday 18th February 1999

8.00 - 8.45am Continental breakfast

8.45am Convention commences
*Introduction - Peter O'Dwyer,
PricewaterhouseCoopers, Dublin*

9.00am *Taxation, Tax Havens and Harmonisation*
*Peter O'Dwyer, PricewaterhouseCoopers,
Dublin*

9.30am *Irish Double Taxation Treaties*
Charles Haccius, BL, Dublin

10.00am Questions & discussion session

10.15am Morning coffee

10.45am *Practical Risk Considerations for the Irish
Trustee: the longtailed effect*
*Enda Murphy, Bank of Ireland
Trust Services, Dublin*

11.15am *Foundations and Purpose Trusts*
Charles A.Cain, Editor, Offshore Investment, UK

11.45am Questions & discussion session

12.00pm Lunch

2.00pm *Residency and Citizenship in the
European Union*
Hilary Belchak, Simmons & Simmons, London

2.45pm *David v. Goliath - Same Result?*
*Money laundering, The Edwards Report,
EU harmonization/OECD*
Paul Dougherty, Simcocks, Isle of Man

3.30pm Questions & discussion session

3.45pm Afternoon tea

4.15pm *Discussion panel: The Edwards Report-
Showing the Way*
*Professor Mason Gaffney,
University of California - Riverside, USA*
Charles A.Cain, Editor, Offshore Investment, UK

4.45pm Chairman's closing remarks

5.00pm End of convention

Registration Form

Venue

The Conrad International Hotel, Dublin, Tel: 00 353 1 676 5555, Fax: 00 353 1 676 5424

Date

Wednesday 17 & Thursday 18 February 1999

Registration details

Your registration fee for the 2 day conference includes breakfast, lunch and refreshments on both days and your documentation pack.

Please note that you will be able to recover the IR VAT @ 21% charged, if you have a registered business in the E.U.

☐ I would like to attend the convention at the special early registration fee (before 6th January, 1999) of GB£895.50 per delegate + Irish VAT @21% =GB £1,083.56

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OUTLINE

Talk on Taxation of E-commerce, S.F., 19 Oct. 99, 2:00-2:30P

TITLE: "Taxation of interjurisdictional e-commerce."

SPEAKER: Mason Gaffney

1. Most writers and reporters in this new field accept state and local sales taxes as part of the natural and established order of things. The predominant attitude is one of how to preserve the state sales tax, by taxing purchases from "foreign" (out-of-state) sources, which are regarded as an administrative nuisance and a leakage.

A. Academic sources.

Textbooks on public finance do not treat the general retail sales tax as the historical novelty that it is. They no longer mention that no state taxed retail sales until 1929 (GA) and 1930 (MS), and most not until 1933 (when California joined the movement with a rate of 2%) and the mid-thirties, by which time half the states joined in. Few books give any weight to the fact that 5 states and one province (Alberta) have no sales tax at all: the states are Alaska, Oregon, NH, Delaware, and Montana. The academics treat these states as eccentrics and laggards, and trivialize them for their small populations, but the states in question, which have 10 U.S. Senators among them, do not see themselves that way at all. One of them, Oregon, retired the powerful Chairman of the House Committee on Ways and Means, Al Ullman, because he championed a Federal VAT. It is rather a matter of some local pride, not to mention commercial advantage. People speak casually about a uniform Federal standard for all states (and all cities and counties within states, over 7,000 taxing jurisdictions in all). But state taxes are a power reserved to each state; not one they will quietly abandon.

Few academics show much concern about its partiality and non-uniformity. They enumerate a few exemptions, but then favor it because it allegedly exempts capital formation.

Even some decentralists seem to favor federal action to promote state sales taxes. Here is the attitude of Charles McLure of the Hoover Institution, who wrote, "I believe sales taxes to be the most appropriate form of tax for state and local govts. to use." He adds, "... the ridiculously unfair and distortionary de facto exemption of interstate sales by mail-order houses" should be banned by federal legislation.

(Curiously, the main theme of McLure's article is in favor of intergovernmental tax competition, which would seem to rule out sales taxes. McLure is a very bright and savvy economist, but he gives no support for his "belief.") McLure is currently active with ACEC, and, not surprisingly, is advising the states to find ways to tax e-commerce.

B. Even more surprising is the attitude of business sources. You'd think they'd show some delight that a new way has been found to undercut the sales tax. Instead, many of these works might as well be written by tax administrators. Their main concern may be making sure that other firms pay, too.

2. My viewpoint is the reverse. I am here to explore how e-commerce may work as a lever to lower or quash sales taxes, and to show how states may do that without making catastrophic quakes or waves.

3. The Commerce Clause.

The U.S. Constitution bans state taxes on interstate commerce. "The Congress shall have the power ... to regulate Commerce with foreign Nations, and among the several States, and with the Indian tribes; ... " - (Article I, Sect. 8).

"No State shall, w/o the consent of Congress, lay any Imposts or Duties on Imports or Exports, ... (Article I, Sect. 10). This reinforces the commerce clause of Sect. 8.

The Commerce Clause has preserved interstate tax competition. W/o it, it is likely that state sales taxes would rise to 20% or more in short order, as the wholesome fear of interstate competition was stifled. It created and has preserved our internal national market, the greatest free trade zone in the world, an essential ingredient of American productivity and prosperity. It is not something to be thrown away lightly, especially not to save something of such dubious value as the retail sales tax.

Sections 8 and 10 are there by design. James Monroe was the leading champion, so I shall herein call the Commerce Clause "The Monroe Doctrine" --one that did and does more for the greatness of the U.S.A. than the later doctrine of that name (actually the work of J.Q. Adams, anyway). Media and academic pundits slight domestic trade, yet this is the basis of our greatness. They write and speak of "trade" and "commerce" and "specialization" as basic good things, but synonymous with international trade.

(Look up "commerce" in The New Palgrave Dictionary of Economics: it says "see International Trade.") States and cities speak of their export industries as their "economic base," yet their internal trade is far more important (Jane Jacobs). Case of Erie Canal: it thrived and made money for 20 years based purely on internal trade, inside state of NY.

4. How Congress might circumvent the Monroe Doctrine - but probably won't.

A. "The consent of Congress."

States may tax imports "with the consent of Congress." *McGoldrick v. Berwind White* (1940) established they might apply a sales tax if the seller has a nexus in the taxing state. *Quill Co. v. N.D.* 1992, seems to have established that Congress has the power to enact legislation allowing states to levy sales and use tax on remote sales, including mail-order and electronic sales, without the current requirement of physical presence. Congress and the President have the power to require all online vendors (and all mail-order sellers) to collect sales and use tax on all sales to all states.

That's interesting, but Congress doesn't pass laws just because it may. It also has power to tax capital gains as they accrue, but it never has, and the leading case where the U.S.S.C. advised Congress it has this power is usually cited to show the opposite, because the Court told the Administration it needed the consent of Congress (*Eisner v. Macomber*, 1920). The very first power the Constitution enumerates for Congress is the power to levy a national land tax (Art. I, Sect. 2, Para. 3), but it hasn't since 1862.

Congress has not lacked for urging and lobbying by the States. The ACEC includes a large number of state representatives who keep asking for authority to tax remote sales, both electronic and traditional.

B. The Uniformity Requirement

Congress is bound by the constitutional mandate of uniformity. "... all Duties, Imposts and Excises shall be uniform throughout the U.S." (Art. I, Sect. 8). Many states are not so bound. There are over 7,000 sales tax jurisdictions (counting cities and counties), and constant flux in the rules. Then there are business license fees: in Riverside, California, for example, business license fees vary from business to business because the city uses 35 (sic) formulas to calculate the charge. Some fees are based on gross receipts, which would seem to make

them city sales taxes, too. The chances of achieving uniformity seem remote, indeed.

One might object that many Federal taxes appear non-uniform, but "the uniformity of taxation throughout the U.S. is geographic, not intrinsic" (Bromley v. McCaughn, 1929; also the Head Money Cases, 1884). Thus, the U.S. may tax maple syrup and exempt cotton, but it must do so the same in every state.

Then there are the 5 states without any sales taxes at all. Can Congress get into helping enforce a Duty, Impost or Excise in 45 states while exempting five?

C. Zeitgeist

The spirit of the times is for Decentralization and "Devolution" - of power and responsibility from the Feds to the states. There are large cuts in Federal programs. Some old centralists, like Alice Rivlin, are still proposing a national sales tax or VAT to be divided among the states, but they are swimming against a current.

The EU and the OECD are centralist, but have hit major roadblocks in their drive for tax "harmonization" among all nations. Even in Europe, the "principle of subsidiarity" (Devolution) is written into the original Maastricht Treaty. Oskar La Fontaine is gone. The Commissioners of the EU have all been disgraced and replaced.

D. Double taxation

Retail sales taxation has always involved some double taxation, as business buy some of their inputs at retail, and then sell their products at retail. With e-products and services this problem grows more severe, because most e-commerce is business to business.

5. The novelty of e-commerce

A. Tendency to overstate novelty.

Every generation thinks it invented sex, and rewrites textbooks on physics, math, and English composition, as well as biology, even as the underlying disciplines remain much the same. Much literature on e-commerce overstates its novelty and underestimates the experience, imaginations and precedents of our forebears. Justice Marshall in Gibbons v. Ogden, 1824, clearly

stated that "commerce" is a broad concept not limited to trade in tangible commodities - he then applied it to ferrying passengers across the Hudson River. In *Pensacola Telegraph v. Western Union*, 1878, Justice Waite explained that transmitting intelligence via the new and intangible medium of electricity was commerce, in the Monroe Doctrine meaning, and "must not be encumbered by state legislation." The Radio Act of 1927 subjected all forms of interstate and foreign radio transmission to Federal control; the USSC upheld it in *Federal Radio Commission v. Nelson*, 1933.

Some novel intangible electronic products may now escape the tax net, it is true; but every retail sales tax is already riddled with exemptions, many of them far grosser than e-products are likely to be for some time to come. Distressing and damning as that is, it has not served to quash retail sales taxation, which legislators love for its revenue capacity; the addition of e-products is not likely to change that.

B. Secrecy, privacy, and evasion.

E-commerce allows greater secrecy in transmitting orders, making payments, and keeping records. To tax sales, a state must know the location of buyer, but this may not be known. Some addresses are merely domain names.

Furthermore, a seller who is found to have nexus in the high-tax state of a buyer may simply change his server location to another state with no sales or use tax.

C. Greater volume

E-commerce may generate a much greater volume of "foreign" purchases than does mail-order at present. It is easy to overanticipate this growth, just as buyers of ".com" IPOs are prone to overestimate future profits, but clearly this is something to watch, even if with a jaundiced and skeptical eye.

D. Problems with business taxes

Many states, like California, apply a "unitary" system to dividing the profits of MNC businesses among jurisdictions. Without it, taxes on business income are a travesty. With e-commerce, however, the old allocation formula is hard to implement. Under the standard allocation formula, the state calculates the world profits of the MNC, and then takes its cut based on its share of three elements: sales, payroll, and property.

Sales: where does the sale occur?

Employees: where do they count, if they live in India and supply a service in California, transmitting the semi-finished product by e-mail. At what stage do you tax it? What if it is re-exported in a final product?

Property: a lot of the assets are intangible. These include parts of the inventory; fixed assets in licenses, copyrights, and frequency allocations. A lot of the assets are highly mobile, like satellites. So, to be sure, are ships and aircraft, but the ships, at least, often escape the tax net. Will there next be flags of convenience for satellites?

Finally, there is encryption. Government security agencies have made great strides in breaking codes and intercepting messages, seeking out keywords, but the code-breakers have a priority in national defense matters, and we may surmise that encryptors are constantly racing to be a step ahead, so this is to be an endless cat and mouse game of growing cost and uncertainty, with substantial loss of revenue.

6. Net result.

Look forward to a new world in which forms of taxation must change substantially. There must be more emphasis on immobile assets. That is not necessarily a bad thing: we've been there and done that, and it wasn't half bad. Professor Wallace Oates, Univ. of MD, writing in the current Review of Economic Literature, refers his readers to his study of Pittsburgh, where he and a colleague found that a shift to a more immobile tax base may have caused a rise in building activity. I cite Prof. Oates because he and Prof. John Schwab approached their subject in the most cautious imaginable way, and their conclusions are about as soft-pedaled as is humanly possible from the data they present.

8. What would happen in California if we eliminated the sales tax, and replaced it by raising the property tax?

A. No catastrophe

1. Five states and the Province of Alberta already get along nicely with no sales tax, so it must be possible.

2. No state at all had a retail sales tax before 1929 (GA). California opened its gates in 1933 with the Riley-Stuart Act, and so did several other states. It was sold as an "emergency measure," at a rate of 2%. As late as 1977 it was

4.75%. Now it is 7.25% statewide, with many cities, counties and transportation districts adding their tolls to the total, but for most of our state's existence we got along nicely with either no sales tax, or much lower rates than today.

3. The Property Tax rate would rise to a level lower than it was before Prop. 13. California sales tax revenues are currently 1.19% of the Assessed Value (A.V.) of taxable property. Add that to the current 1%, and get 2.19%, compared to 2.7% before Prop. 13 - except that the 2.7% was applied to actual value, while today's assessed valuations are far below that.

The A.V. value of property is probably about 1/3 or so of market value.

B. Greater equity.

The distribution of the tax burden would shift from poor counties to richer ones. Thus, in the poor inland counties of Fresno, Tulare, Imperial, and Stanislaus, sales tax revs are about 1.5% of A.V.s. In rich coastal and suburban counties of Sta. Barbara and Marin, sales tax revenues are about .75% of A.V.s. Thus, the state sales tax takes a lot more money from the poor counties than it would cost them to replace the services from local taxes; the rich counties, with the high property tax bases, are contributing less to the common pool than they are saving in property taxes.

Within counties, by extension and analogy, I am reasonably certain that a careful study will show that the burden would shift from poorer cities and districts to richer ones. Again, among individuals, I believe we would find the same. One of these days, God willing, I will find the time and money to conduct or sponsor such a study.

The relevance here of this equity question is that most states and provinces have complex and expensive systems and formulae for "power equalization," and the like, designed to shift resources from rich counties to poorer ones. One reason such programs are needed is to offset the effects of the very same state sales taxes used to finance them. There are great savings to be realized by quashing this cross-hauling of public funds.

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Four Seminars

M. MASON GAFFNEY

Assistant Professor of
Economics, N. C. State
College

Financial Maturity and Optimum
Rotation Periods in Timber and
Other Appreciating Assets.

Thursday, February 21
3:30 P.M.
Room 222, D. H. Hill Library

ROBERT H. STROTZ

Associate Professor of
Economics, Northwestern
University

The Ethics of
Income Distribution

Monday, March 25, at the
Meeting of the North Carolina
Economic Association

D. GALE JOHNSON

Professor of Economics,
University of Chicago

To Be Announced

Wednesday, March 27
3:30 P.M.
Broughton Auditorium*

JOHN W. KENNEDY

Head of Department of
Economics, The Woman's
College of the University
of North Carolina

Some Recent Developments in Labor
Relations

Thursday, May 16
3:30 P.M.
Room 222, D. H. Hill Library

* Sponsored jointly with the department of
Agricultural Economics.

Intro

Changed rules. Longer than 15 min. Unilateral action by me orig. Committee, after getting flavor of MS, gently advised no one read it anyway. Other hand, walk's tightrope, one man advised me he had read it & I'd better give him chance to prove it, so he'll feel he got some good from it.

Break in any time. Don't worry re ego - I'm here to learn. Besides, already shattered, as only a woman can. Colleague, Mass Bay, New Yorker. "To NY-er," I said, burst's, "really think --?"

"O, yes", sweet young thing, "most glorious depts. Block... (or was it squash that author?)

Visualized self laugh's stock of U.S., scurried --

So see, intell. content has had quite impact already.

Other comments: "Never make any m. w. that stuff"

"But 20 pages back you said 'I in conclusion'"

Shattered remnant

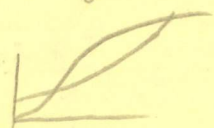
Sorry about math. Did of math, understand anything. Trouble is, nobody can understand you. Only excuse, didn't solve w/o it.

1. Problem, when cut tree. ~~Also~~ Not typical - most
2. cap. depreciates. Still are other analogous resources - alcohol, livestock, ^{price apprec'n, own inventory. Any periodic income.} Also, problem has history in ec. doctrine.

~~Had~~ Nothing further from intent than take over dreamy, sterile battle of words betw. Hayek & Knight, but cannot help thinking Austrians were thinking of trees - & overgeneralized it. Problem caught imagin of many ec-sts, seeming simplicity, good copybook e.g. ~~Actually rather difficult~~

3. So simple, so popular, you'd think wd. be worked out long since. I several seem to think have. But its simplicity is deceptive. I know of no one who has.

4. Let's formulate problem. Have known regen. cost, c , growth curve, & i . ^{These are givens.} (Draw g , & compounded costs)



2 genl. approaches; $\max$ or $\min$. Will use $\max$. approach

~~Excess~~ What $\max$? In some sense, is excess of g over $c(1+i)^t$ (I've laid a few too)

Mix metaphor - soil lay egg every so often. Want to $\max$. value of egg, ~~must~~ w. due consideration to time. How give that due consid'n is our problem. ~~We~~

We have some choice, can sacrifice size for time. How balance? a typical ec. problem.

5. 2 elements of urgency. Problem is to work them both together. One is ec. of ^{capital in trees} expressed in i , as MC of time. Want nearer present to $\min$. that. Expressed by discount'g.
- Two is ec. of ^{under trees} land expressed in soil rent, a , as MC of time. Want nearer present so devote fewer yrs of land use to get egg. Expressed by averaging $\frac{a}{t}$.
- Even w. 0-int, still want to $\max$ inc. per unit of time. Getting 5 eggs per 100 yrs is better than getting 4, is same as if each were 25% bigger. Cf. 20 yrs vs 25, not only get yield 5 yrs sooner, but save 5 yrs use of site.
- (Each forest use competes w. other forest use, as well as non-forest, w. annual yields)

6. Reason ec-st^{ersters} have proposed so many diff. solutions is they have not considered both elements together. Look at proposals.

7. As pt. of ref, start with N , max. egg, seems to hv. disc., but only part. Leaves egg undisc. ^{Since it} Doesn't even disc. adequately, needn't mention other faults.

In mgnl terms, $\frac{dg}{dt} = \frac{d}{dt} c(1+i)^t = c(1+i)^t$

i.e. $g' = \text{int. on } c(1+i)^t$. But that is only part of yr inv. now - is egg too.

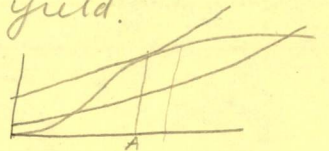
✓ This might appear good by false analogy to production ec. (over)

Obviously in complete, 1st formulation we'll consider seriously is Allen.

8. So Allen disc. egg, too. Max. $\frac{g - c(1+i)^t}{(1+i)^t} = \frac{g}{(1+i)^t} - c$

Same as simply max. $\frac{g}{(1+i)^t}$, discounted net yield.

Gives earlier max, natch. ✓ Draw on board.



Fault is in recognizing only one sort of urgency.

This shows up in several ways.

a. Zero-int. Max g . Good sol-n shd. approach max $\frac{g}{t}$ at any fixed i . Max annual yield. But $A \rightarrow \text{max. } g$.

b. Mgnl analysis. Set deriv. = 0, $g' = gp$. ^{MP} ^{MC} Are not including annual use of site w. MC.

c. Regen. costs, no effect. Seems plausible if c rises, shd lengthen rot-n, to spread that cost over more output. Allen throws away this parameter.

Where, mov'g to nt , add just one input. Here, add time,
add willy-nilly the time-vector of both cap. & land. Land
vector adds 2 elements: itself, currently; & cap. from its past
inputs. N accounts for neither

8 (cont)

of value of your investment.
(p. 24)

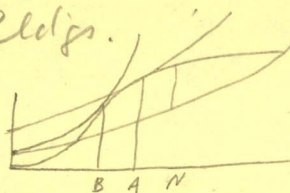
d. Implied growth curve. ¹ Implies that when you plant, plant's immed. becomes worth $\frac{g}{(1+i)^t}$ max. ¹ Sudden jump. ^{It is to achieve this max. you select this not-n.}

Implies that is present value, ~~that otherwise why max. it?~~
~~But it isn't. We know immed. on plant's, value of inv. is only C.~~
Input's contrib. of site to C.

So is inadequate.

9. 2d dis^{counting} type sol'n is Bldg's.

He imputes egg to i .



Some odd implications:

- Can have infinite internal i , where C is zero. ^{Can make $i \rightarrow \infty$ deliberately.}
- Δi , no effect. (external i , that is)
- Inv. in land yields nothing; in regen. yields above external rate; ~~in~~ & external rate remains unchanged, use for other parts of business.
- System of triple int. rates, ^{one zero, one can be infinite,} full of absurd impl-n's.

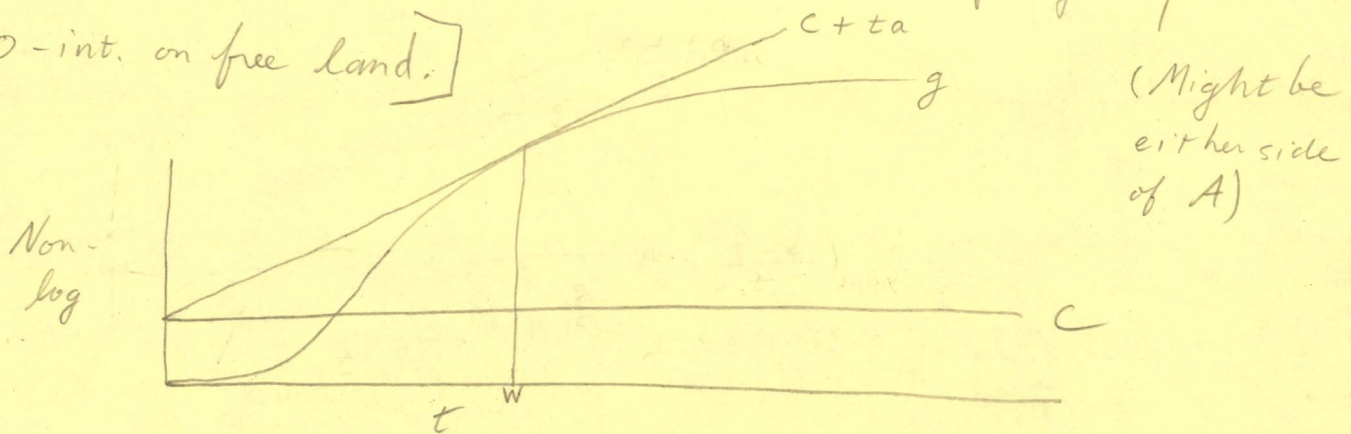
Pretty obviously just attempt to find quick, simple, single-factor solution, no particular reasoning behind it.

Proof Bldg's offers extraordinarily inadequate - downright sloppy. Nothing much to be gained

by analyzing it closely. Numerical e.g., max. "at 2", same as max. a. pp. 40-47.

10. Now a solution that has reverse fault: recognizes ^{2d element of} urgency, ~~of~~ ec. on no of yrs of land use; but ignores int. "Forest Rent". Max $\frac{g-C}{t}$.

[Note, is not max. g . Far short of that. Max. g is what get when dismiss both elements of urgency — 0-int. on free land.]



Arguments for it? Not fully conversant w. all forestry lit., but what have seen manifested more a propensity toward it than argument for it.

10. (cont.)

Hv. listed some conjectures, pp. 51-55. I regret that some seem to be impugning motives of those who make this argument — ^{magg, prof. aggrandizement} — not conducive to objective discussion. But where you find idea pressed stingily, no rational argument, led to suspect subterfuge, unmentionable motives as reasons.

Wd. make fascinating study in hist. of ec. ideas, for one int-d in ^{Thomson, links to Rodbertus, socialists.} that field; also hist. of reform movements in Am.: Pinchot, progressive movement, forest reserves, conservation movement, linked w. reform ideas, anti-Wall St., anti-interest feeling.

11. Finally, how + thread way among fallacies to correct solution?

Back to the egg.

Can't simply max. annual ave. — wd. take no acct of int. on egg.

No simply disc. — Allen already tried, no acct of soil rent.

We can agree, I think, for uses w. const. annual yields, + the best (over)

~~Correct solution, I submit, is to max. the~~

~~annual equivalent of the egg: amt which, received annually, compounded, & accum. w. the int, wd = the egg in t yrs.~~

~~Call it it.~~

~~$$\text{Egg} = a + a(1+i) + a(1+i)^2 + \dots + a(1+i)^{t-1}$$~~

use is that w. highest net annual yield. (assume it, anyway.)

So solve this problem by annualizing the egg. Find that amt which, received annually, is same as receiving egg after so many yrs. & max. it.

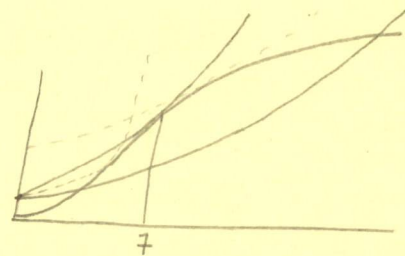
How annualize?

$$A = a(1+i)^{t-1} + a(1+i)^{t-2} + \dots + a(1+i) + a = a \frac{1 - (1+i)^t}{-i} = a \frac{(1+i)^t - 1}{i}$$

$$\text{so } a = \frac{Ai}{(1+i)^t - 1}$$

In this case A is the egg, $g - c(1+i)^t$

$$a = \frac{i(g - c(1+i)^t)}{(1+i)^t - 1}$$



This solution free from weaknesses of others.

a. Incorps. both elements of urgency

- If $i = 0$, reduces to $\frac{g-c}{n}$, a constraint, & not max. g

- If i increases, shortens max. - is sensitive to int. If $a = 0$, reduces to Allen & Bldg solutions. Show graphically.

b. Allows for other factors - is truly a 'net' solution, an ~~opt~~ optimizing solution. Is ok to max. once you have netted.

c. Mgmt terms, ~~can be~~ $g' = gi + a$, omits none of ΔC of time. (Can also be derived as time-increase of $TC = g'$)

d. Growth ^{of accum. costs, hence of perfect mkt value of trees} curve implied, is smooth, unlike Allen. Involves no dual price system, like Bldg. & it makes sense: $c(1+i)^t + a \frac{(1+i)^t - 1}{i}$ when $t = 1, \dots$ etc.

12. How much diff. does it make?

Table 1, p. 4

2, pp. 29-30

3, ~~pp.~~ 34

5, p. 46

With shorter rot-m, e.g. livestock, ~~not~~ more diff., except
 $W \rightarrow 7$

13. Criticized for difficulty. Odd, forster, speed of
 computation. Can be made very operable.

$$p = \frac{g'}{g-c} \frac{(1+i)^c - 1}{(1+i)^c}$$

Tabulate $\frac{p}{\phi}$, Table 2, p. 29

14. Once have solution, proves very useful, & ~~is~~ just feed into formula info. & ~~get~~ draw signif. inferences.

pp. 62-69

Some int-s inferences:

Δi doesn't have prop. effect on $\frac{g'}{g}$

ΔC lengthens rotations

const. annual costs & rev. do not affect rot-n.

Taxes depend on how levied.

Forest can pay up to max. a

Opt. C is that max. a

Can forego a annually for forestry.

15. Much data suggest standards of forest practice not hi.
No reflection on foresters, but landholders who don't listen.

One fig. struck me esp. '56 stat. abstract

for U.S., in volume, net growth is 2.75% of net volume.

For softwoods, 1.97%; hardwoods, 4.49%. Not at margin, but aggregate. To cover not just int, but all costs.

Suggests tremendous cap. locked up in our forests is not very productive. One reason is overly long rot-n. Hope present study may contribute something toward shortening them. Now, reached stage over

of chronol. maturity. Will release your time resources, ^{to their production alt. use} by cutting
this short at now.

→ The 1st yr's input of land is being treated same as C. - compounded thru. But later inputs can't be compounded as much.

C is consumed in production, site rent.

$$S_e i = a. \quad a \frac{(1+i)^t - 1}{i} = S_e [(1+i)^t - 1]$$

Difference of site & C. A C is inv. once. Subsequent

MC of time is just int on accum. $C(1+i)^t + a \frac{(1+i)^t - 1}{i}$

Land, contrast, gives annual use. as it accum. becomes part of

cap.

$$S_e (1+i)^t - S_e = a \frac{(1+i)^t - 1}{i}$$

$$S_e [(1+i)^t - 1] = \frac{a}{i} [(1+i)^t - 1]$$

Re assum's fixed $\leq 8i$, externally.

3 pts.

1. Is conventional ass'n

2. Even if not so, my ~~own~~ criticisms still good. & my error slight

3. partly is so. Other forest land users, see a i.e. there is much land whose best use is forestry, & whose value, a , must be determined in forestry. ~~Cap~~ Money inv. in regen. costs, other hand, might go elsewhere. Esp. as cap. turns over, land doesn't. Ea. time turns over, is turned to money, is new decision how to invest it. ^{& little part of land held by any of other enterprises.} The land is also released, but not turned to money, hence less mobile. ~~Cap is a "fund"~~ Equipment, also, depreciates, becomes m, can be turned to other uses. Men adapt, or grow old. Land remains. In long run, if is surplus, only land can claim it, remains fixed, & specialized. Prepare to meet indeterminacy argument wherein imputation

uncertain bcs no cost is externally determined. I assume C & i are 'given', but 'a' is not. One max-ges a under these constraints. Why not take 'a' as given, as best alt. use, ^{& C given, & max. i?}

Not like Bldg, but allow's fixed return for a . You cd. I prefer this, tho, bcs if you get i above what other inv's yield you, you can pour it into forestry, so is fair to regard it as externally fixed. Same with "C". But if get a above alt.s. --- can also add land to enterprise, until you bring down its a to = cost.

So my solution is limited: an ass-g fixed C & i --- over

But if it is wrong to impute ~~over~~ to c & i more than external cost, is not also wrong to so impute to a , & rotate accordingly? Any excess shd result in expansion until no excess remains. Expand c or land? No matter - to whichever you impute it, expand, will it raise returns to other, cause to expand.

Until you have expanded, opt. rot-n may be indet. Might impute excess either to a or i . Maybe, tho, you get same result, either way?

I know what get inputs to a Try i . Max. i ,

~~$$c(1+i)^t + a \frac{(1+i)^t}{p}$$~~

$$g - a \frac{(1+i)^t - 1}{p} = c(1+i)^t$$

Solve for i , max it.

$$g = (1+i)^t \left(c + \frac{a}{p} \right) - \frac{a}{p}$$

$$(1+i)^t = \frac{g + \frac{a}{p}}{c + \frac{a}{p}}$$

$$g' - a \left[\frac{p^2 (1+i)^t \frac{di}{dt} - ((1+i)^t - 1) \frac{dp}{dt}}{p^2} \right] = cp(1+i)^t \frac{di}{dt}$$

$$g' = 0 \quad (? !)$$

$$p(1+i)^t \frac{di}{dt}$$

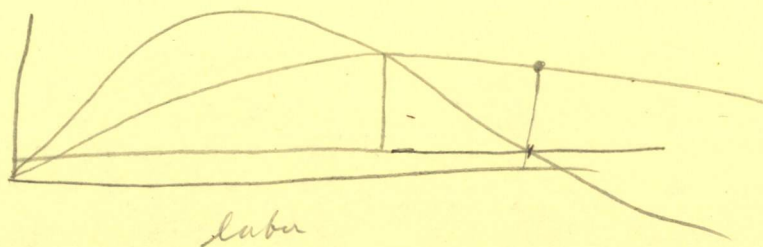
$$= \frac{\left(c + \frac{a}{p} \right) \left(g' + a \frac{dp^{-1}}{dt} \right) - \left(g + \frac{a}{p} \right) \left(a \frac{dp^{-1}}{dt} \right)}{c^2 + 2 \frac{ca}{p} + \frac{a^2}{p^2}}$$

$$\frac{d}{dt} \frac{1}{p} = -p^{-2} \frac{dp}{dt} = -p^{-2} \frac{di}{dt} = -\frac{di}{dt} \frac{1}{p^2(1+i)}$$

$$0 = \left(c + \frac{a}{p} \right) g' ; \quad cp = -a, \text{ or } g' = 0$$

$p = -\frac{a}{c}$ This is imag, since a & c both $+$. What's wrong?

Graphically, can see wd. not get same answers.



Someone asks, why max. rent per t , where t is variable input?

Is it analogous to max. AP labor? Which is max rent per man?
 i.e. net of wage.

No, bcs when t varies, land & cap. both vary, diff. situation.

✓ Bld'g is analogous to max AP one factor bcs inputs all to one input, which is essence of fallacy.

Ans: Why is lower c going to Δa by more than it reduces other time-costs? We know it must be so because

$$[\Delta c \text{ of time} \equiv \frac{dg}{dc} T' = (1+i)^t (c_p + a)]$$

if ~~if~~ c goes so high that $a = 0$, not-n lengthens out to Allen. Know it from $p = \frac{g'}{g-c} 0$.

More directly:

$$T' = a + pT$$

$$a = i \frac{g - c(1+i)^t}{(1+i)^t - 1}$$

$$\frac{da}{dc} =$$

$$T_p = pc(1+i)^t + a \frac{(1+i)^t - 1}{\cancel{x}}, \quad \frac{dT_p}{dc} =$$

sub in "a",

$$T = c(1+i)^t + \frac{i}{p} [g - c(1+i)^t]$$

$$T_p = cp(1+i)^t + i[g - c(1+i)^t] = c(1+i)^t(p - i) + gi$$

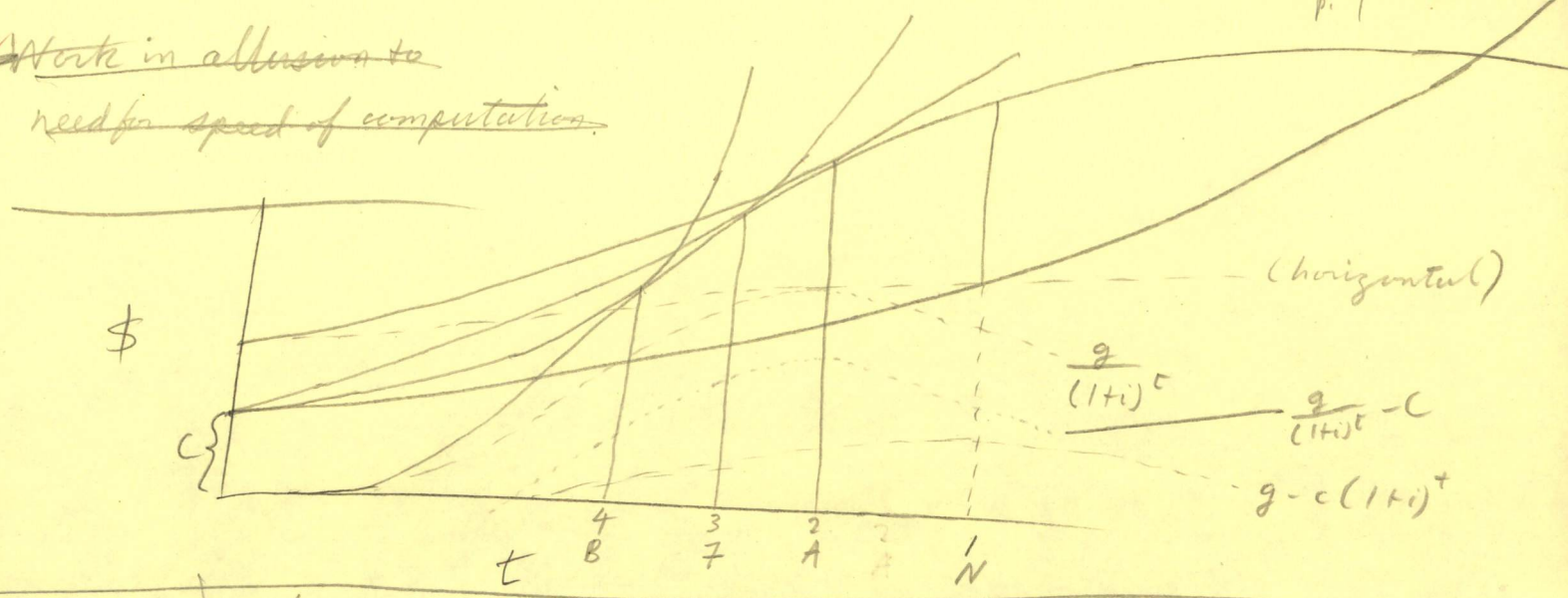
So T_p declines very very little.

✓ Need to ee-ge on no of yrs of cap use?

No, it has no future use, when cut
it it's gone - - -

If want to look at it that way,
land, too, has cap. value, & a is
its annual cost, correspond's to
int. on cap. - - -

Work in allusion to
need for speed of computation.



Fundamental, simple sort of problem, you'd think was worked out yrs ago.
 Successive approxim. Periodically, soil lays eggs. We ~~cannot~~ have some
 choice as to size, & timing. Like as much & as soon as possible. Problem of balancing the 2.
 or net product of soil yield are 2 reasons for lower

1. Max. $g - c(1+i)^t$ where $g' = cp(1+i)^t$ (or $p = \frac{g'}{c(1+i)^t}$)

No special merit in this. ~~He applied no time discount factor to~~
 Faults: ~~Not discounting soil yield (are in effect disc. rest of yield)~~
~~Not time-averaging. e.g. 50 yrs vs 30 yrs, not only are yields deferred, but also are devoted another 20 yrs use of site. Neither simple are, nor simple disc. will do~~

But rates =, $\Delta C = \Delta P$? Not w. time ec. In prod-n ec.,
 move to rt, add just one input. Time-ec., add time, - ~~rest~~ $\&$
 willy-nilly time-vector of ~~several~~ ^{all} inputs. $(1+i)^t$ curve
 only shows one. (Time-vector of land, const annual cost; of cap.,
 keeps growg, as annual contrib of land & cap is saved)

2. No disc. soil yield, too. Allen's sol-n.

$$\frac{g - c(1+i)^t}{(1+i)^t} = \frac{g}{(1+i)^t} - C$$

Max. disc. soil yield, same as max disc. g

Rates = ? $g' = gp$. (slopes of logs =) (rate of growth of $br. \frac{g'}{g}$, = rate
 of growth of cost, $p (= \frac{cp(1+i)^t}{c(1+i)^t})$ Omits time vector of site.
 2d manifestation of error - implied growth curve

want's sooner: ee. for cap. secreted by soil, & ee. on soil.
Further problem of working those 2 together.

~~Mention why max a is not single factor - are allowing for others.~~

What is matter? H.V. forgotten it is soil yields per yr. that count. Are 2 manip.s nec. to ec. on time. 1st, time-distrib-n; 2d, simple quantity. $\frac{g}{t}$, averaging. ~~to 7+ is annual = nt~~ of soil yield we shd max.

~~So max $\frac{g}{t(1+i)^t}$? Not quite it either~~

~~$\frac{g - c(1+i)^t}{t(1+i)^t}$?~~

~~$\frac{t-g}{(1+i)^t - 1}$~~

How get? Can't simply discount ave., $\frac{gt}{(1+i)^t}$, bec

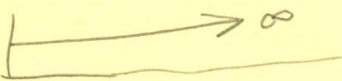
~~justify annualizing~~ ~~cleanest~~ this: forestry in comp. w. uses w annual yields. ~~Even if no or negligible int., soil yield per yr is basis of comp-n. - 20-yr not-n twice as good as 4-yr, of same soil yield.~~

(Why doesn't same reason's apply to cap. input? Bec at 0-int, we impute all increase, $g-c$, to soil, cap. has no yield above replacement. If anyone pursues this suppositions gn deeper, makes sense, bec w. 0-int. l.v. are inf., still must earn return, while cap. values not inf. But if anyone does, steer away, for then hyp. has ceased to serve fn of clarify'g gn. Get into how compute annual = nt)

✓ (at 0-int, a delivery-truck, e.g., wdn't have inf. value. It yields finite value, say \$2000, in 5 yrs. ~~you can't charge int. on it, remains 2000 in perpetuity. (Lorr)~~ ~~you pay inf price, you left w 5000, all other prices~~ ~~inf. (Lorr)~~

~~Can't~~

✓ Or derive cap value as area under curve

Land 

Cap 

✓ 3. a. To max. annual =nt of net yield. i.e. sum which received annually, compounded, cumulated, wd grow to yield.

"a"

$$A = a + a(1+i) + a(1+i)^2 + \dots + a(1+i)^{t-1}$$
$$= a \frac{1 - (1+i)^t}{1 - (1+i)} = a \frac{(1+i)^t - 1}{i}$$

$$a = \frac{Ai}{(1+i)^t - 1} = i \frac{g - c(1+i)^t}{(1+i)^t - 1}$$

$$\frac{da}{dt} = i \frac{[(1+i)^t - 1][g' - cp(1+i)^t] - [g - c(1+i)^t]p(1+i)^t}{v^2}$$

$$= \frac{i}{v^2} (g'(1+i)^t - g' - gp(1+i)^t + cp(1+i)^t) = 0$$

$$(1+i)^t = \frac{g'}{g' - gp + cp}$$

or solve for p, $p(c-g)(1+i)^t = g'(1 - (1+i)^t)$

$$p = \frac{g'}{c-g} \frac{1 - (1+i)^t}{(1+i)^t} = \frac{g'}{g-c} \frac{(1+i)^t - 1}{(1+i)^t}$$

Gives 7. soln

1.4

3.6 This max. also turns out to be mgnt'st sol-n.

~~also~~ is max S_e

4. Another proposal is Bldg's, max. i_B . Fallacy of inputs
all returns to one input, C_0 .

Growth curve $C(1+i_B)^t$. Show is diff. from

$$C(1+i)^t + a \frac{(1+i)^t - 1}{p}$$

↑

Must start off almost linear,

$a, 2a, 3a$, so hits g to rt. of B

Show this graphically.

g approaches slope of S curve as t gets very large,

$$(1+i)^t - 1 \rightarrow (1+i)^t, \Delta \text{ curve} \rightarrow (1+i)^t \left(C + \frac{a}{p} \right)$$

Annual Rate of growth here is " i ", same as with $(1+i)^t C$, so log curves

are 11. As I say on p. 44. Ok

(7 poo-poo zero int. But the lower is i, the greater is a, & the more ~~important~~ does 7. differ from A & B. If anyone gets rough on their being so close together, note w. zero int. **B** is fixed, 7 lengthens ~~a little~~ to W, & A goes out to Z, say 200 yrs, tremendous spread.)

(If rationalize ignoring soil rent bcs A & 7 are close, consider w/o 7, choice is A or B, farther apart - must decide which way to ignore soil rent, & is no sound argument for either)

Tree Farming Program Gains Ground

By ED LONG JR.

Eastern North Carolina farmers making plans for the new crop year should take a second look at their overall picture — they could be forgetting the background.

Too often the farmer's entire attention is given to his annual crops and his woodlot remains simply a background for his everyday operations.

But the farming of his trees can have a great economic importance for the farmer these days, an importance magnified by North Carolina's growing wood-using industry.

Tree farming is just what the term says and the increasing number of green and white diamond-shaped Tree Farm signs springing up along North Carolina's highways are proof that more and more Tar Heel farmers realize the extra value they get from their woodlots.

The industry-sponsored Tree Farm program in the state, which recognizes a woodland owner for his work in good forest management, is one that makes a lot of sense.

Trees Are Crop.

Its basic idea is that trees are a crop—a crop essential to the forest industries which depend to a great extent upon the small woodland owner for much of their raw materials. But unlike other crops, trees can be tended and harvested at a time determined by the owner.

A little work goes a long way and for many farmers, the benefits can be almost immediate. Most woodlots need to have trees removed, to give the better trees a chance to grow. Right there is an opportunity to make a sale of pulpwood. Other thinning opera-

tions in the woodland area can be made as time passes and before many years, a stand of trees of sawtimber size is ready for the harvest.

It's simply good business to give thought to the trees in the background.

Reason For Program.

And that's the reason for the North Carolina Tree Farm program. Operated in the state by the North Carolina Forest Industries Committee, a group of wood-using industries with a desire to further conservation activities, the program is administered by a group of professional foresters who review thoroughly each ownership submitted for certification as a Tree Farm.

The program is not complicated. An owner who is managing his woodlot wisely — protecting from fire, insects, disease and overgrazing; planting idle acres to trees, and harvesting continuing crops of trees — makes application to the Tree Farm Committee.

An inspecting forester, usually one representing the industry of the state, goes with the owner to make an inspection of the property. If the forester feels that the area can meet Tree Farm standards, he submits an inspection report form to the committee. If he feels other work should be done, he advises the owner on the proper steps.

Once a report form reaches the state committee, which has regular meetings during the year, it is carefully considered. Upon receiving the committee's okay, the property is officially certified as a Tree Farm. The owner then receives a certificate and a Tree Farm sign.

There are now 158 certified Tree Farms in North Carolina, embracing 1,046,890 acres over the state. The Tree Farm Committee is to meet again in April, at which time a number of new Tree Farms will be certified.

The North Carolina program is a part of the American Tree Farm System, active in 44 states under the administration of American Forest Products Industries, Washington, D. C.

Eastern North Carolina farmers and landowners interested in learning more of the program can receive additional information from the secretary of the North Carolina Tree Farm Committee, 614 Commercial Building, Raleigh.

Plan New Program In Harnett County

LILLINGTON—The Harnett County Agricultural Workers Council has voted to begin work immediately on the promotion of community development programs in several key neighborhoods.

Five white and three Negro communities were suggested for the first trial of this type of agricultural development program in the county.

John W. Crawford, program planning specialist for the State College Extension Service, was guest speaker at the council's meeting. He told the group that community development programs have proved the best method to put into practice many needed improvements in North Carolina.

The program in Harnett will tie in with work of the new seven-county Capital Area Development Assn.

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GREENVILLE, N. C.

Break down by regions, probably find NW very low.
1956 Stat. Abstract, p. 700.

U.S.	Total	Soft	Hard
Net volume	517	355	162

1-1-1953.

Net growth	14.2	7.0	7.2
1952			
%	(2.75)	(1.9)	(4.4)
Net cut	10.8	7.5	3.3
1952			
%	()	()	()

Source: D.A. Forest Service,

Timber Resource Review,

nd, prelim. draft

On "commercial forest land" only

Stat. Abstract, '51,
p. 650

Vol. of saw timber on
commercial forest land, U.S.

Vol. (billion bbls)	Growth ()	% growth (%)
Hard 305	13.5	4.4%
Soft 1,296.	21.8	1.68%
Sum 1601.	35.3	2.20%

Very small. Add to
paper.