Rising Rents: Valuation, Carrying Costs, and Effects of Property Taxation
By Dr. Mason Gaffney

Article citation:
Gaffney, Mason. “Rising Rents: Valuation, Carrying Costs, and Effects of Property Taxation.” December 1, 1985. Study guide.

Fair Use Disclaimer
The Robert Schalkenbach Foundation, a non profit private foundation, is publishing this article, at no cost, pursuant to the Fair Use provisions of Section 107 of the Copyright Act which states that under certain circumstances, the fair use of a copyrighted material for purposes of criticism, comment, teaching, scholarship and research is not an infringement of copyright. If you have any concerns about the publication of this article, please contact us at **info@schalkenbach.org.**

The Robert Schalkenbach Foundation’s Digital Collections and Archives is an extension of the Robert Schalkenbach Foundation’s Engel Georgist Library. It collects, organizes, preserves, and provides free online access to researchers and the general public of Georgist literature including books, newspapers, pamphlets, scholarly articles and archival materials.

RSF is particularly proud to offer free online access to the works of the late Georgist scholar Mason Gaffney, made possible through the generosity of the Danica Foundation and with the consent of the Mason and Letitia Gaffney Trust.

Robert Schalkenbach Foundation: https://schalkenbach.org/
Engel Georgist Library: https://www.librarycat.org/lib/EngelGeorgistLibrary
RSF Digital Collections and Archives: https://schalkenbach.starter1ua.preservica.com/

Rising rents: valuation, carrying costs, and effects of property taxation

Notes by M. Gaffney, Dec. 1, 1985, for class use

INTRODUCTION AND DEFINITIONS

Recently I told my class in public finance about the basic capitalization formula (Eqn. 1, below). Staring at it on the board I suddenly was overwhelmed to realize how much more there is in it than I could possibly tell in any reasonable time. There is nothing published that begins to cover it adequately, in spite of its central importance in real estate and public finance. So I decided to write it all down. Now, three working days later, I realize why I felt overwhelmed: there is so much to milk from this one simple equation.

These notes deal with a perpetual stream of net rent or other pure net income that is expected to rise indefinitely into the future, beginning from "a" dollars per year. Think of it as the annual rent of land, a kind of pure net income. A usefully expressive and analogous concept from property law is "usufruct", "the enjoyment of the income of an estate without impairment of its substance".

For a simple model we assume a constant yearly fractional growth rate, g. The cash is measured in current dollars (not constant dollars), so the rise may be due both to real causes and to inflation. The nominal interest rate is "i". The income begins with "a", received at the end of the first year, and then rises at a compound rate of g per year.

The lump-sum up-front present value is "V". V is often called the "capitalized" value -- not that it is capital, for it is not stored up by saving, nor can it be drawn down by dis-saving. But it is expressed in the same present-value terms that are customary with capital. "Capital value" is a common contraction of "capitalized value".

When speaking of land rent we may also call it cash flow (or service flow) because, since the land does not depreciate, the cash flow is also the net income. But it must be understood that the depreciation of buildings on the land is deducted first along with other expenses, to arrive at the net rent of the land. To

finesse this complication think of this land as yielding its cash flow without any buildings: it could be a parking lot, a storage space, grazing land, or other such use.

[In practise the model to be developed is also used loosely for typical "income properties", meaning real estate including durable improvements on land, where real depreciation is very slow and can be overlooked for the first several years while general inflation makes money rents rise. This is however a treacherous practise and is not recommended in general for it may lead to overvaluation. It is only the land portion of real estate that is generally invulnerable to physical depreciation.]

"a" is gross cash flow. As used here, gross cash flow means revenues less expenses and less income taxes and less all taxes other than property taxes on the land value itself. So what is gross about it? It is gross of the costs of carrying title to the subject land itself.

("Net cash flow" will be used later, below, in §8, on "Negative cash flows". Net cash flow means gross cash flow less "carrying costs". "Cash flow" in general, like most terms in economics, is used variously in different contexts by different people, so make an extra effort to remember how I am defining it here and now for this paper.)

"Carrying costs" (cc) refers to the financial costs of carrying the subject land itself, but not to the costs of financing improvements to the land, or working capital used on the land. Thus, in arriving at the amount "a" one deducts interest on production credit used to carry payrolls and raw materials; but does not deduct interest on mortgage debt used to buy the land itself.

(There is a portion of debt service that goes to amortize the principal. This portion is not even part of carrying costs. It is something else again, an investment in buying title to the land. Carrying costs are pure time costs that hold the land without building up any equity in it. They are the pure costs of enjoying the usufruct without either impairing or augmenting the substance of the estate.)

All that may sound very fussy and picky, but it is only the basic accounting anyone has to go through to put a value on any

asset. It just sounds like a lot when it is thrown at you all at once. It may seem to answer many questions you never asked, but if you want to analyze and understand basic economics you have to answer all those questions. Every one will come up, and trip you if you aren't ready for it.

But the answers won't help unless you yourself get curious enough to ask the questions. You will probably do so as you read on -- when you do, refer back here for the answers. (And if you don't? Well, there's always a demand for good window washers.)

The asset yielding the cash is real property, subject to the property tax. The property tax rate is "t", levied against the base V, which is the capital value. As to income taxes they are not treated here. Think of the cash stream as being disposable income, after income taxes, and including the effective cash value of deductions.

The value, V, is the sum of an infinite geometrical progression whose first term (f) is a/(1+i) and whose rate of progression (r) is (1+g)/(1+i+t). The sum is known to be f/(1-r). Substituting in the values as defined, we get our basic formula:

$$V = \frac{a}{i+t-g} \qquad (1)$$

By rearranging (1) in various ways we can derive a large number of insights -- amazingly large, and (to me) thrillingly insightful -- into valuation, finance and taxation.

1. Valuation of real property.

"Real" property means an asset that includes land, and therefore has a perpetual life expectancy. (1) derives capital value, V, from the current year's cash stream, a, and the factors i, t, and g. The process of converting a stream or flow of cash into a corresponding up-front value is called "capitalizing". When dealing with common stock, V/a is called the price/earnings ratio, or P/E. (Common stock is not subject to the property tax, but the same term may be used in real estate.) In England it is called "years' purchase", meaning the number of years of cash flow required to purchase title to the property. You can see that this important number is equal to the reciprocal of (i+t-g).

The market process by which i and t and g determine V is called "arbitrage". It is based on constant buying and selling by shrewd and savvy investors. It is one of the more finely-tuned market processes, and quite reliable in practise, especially in regard to i and t.

(As for g it is a future expectation and therefore not subject to precise measurement or automatic correction of errors. There is an irrational side to human nature which is repressed by objective reality when dealing with the present, and which therefore finds a natural outlet in anticipating the future, with results often bizarre. We cannot say, therefore, that the response to g is finely tuned because there is no way of knowing what g is: it lurks in the dark corners of fevered minds. To keep the present demonstration brief and mathematical, however, we will treat g as an objective fact.)

2. Tax capitalization.

The process of adding "t" to the denominator of (1) is called "tax capitalization". (This is based on the assumption that the tax is not shifted, but is entirely borne by the holder of title to the subject real property -- an assumption which I accept.) Adding "t" as shown has the same effect as subtracting tV from the numerator, instead. In fact, you can rearrange the terms of (1) to do exactly that. Then we have:

$$V = \frac{a-tV}{i-g} \qquad (2)$$

3. Capitalization of growth expectations.

The process of subtracting "g" from the denominator capitalizes the expected growth. Subtracting "g" as shown has the same effect as adding gV to the numerator, instead. You can rearrange (2) to do so. Then we have:

$$V = \frac{a-tV+gV}{i} \qquad (3,a)$$

Alternatively you can leave the "t" downstairs:

$$V = \frac{a+gV}{i+t} \qquad (3,b)$$

You can pick any of the alternative forms, depending on what you want to emphasize.

gV is the annual growth in V. We defined it as the annual growth of "a", to be sure. But with each passing year that means that every term in the infinite geometric progression is g times higher than before, so you just multiply through by g and get V higher by that same factor. This exercise is left to doubters.

If you are a stock peddler (uh, sorry, that's "Account Executive") you want to focus the buyer's attention on gV. The P/E becomes V/[a+gV]. ("t" is zero in this case.) Of course the official P/E listed is just V/a, but the job of the account exec. is to justify the high price by highlighting gV. Oriental rug merchants do the same thing ("It's an investment, my friend, it will appreciate for your old age.") And of course, above all, land boomers do it. As the saying goes, lawyers do it with license, but Realtors do it with appreciation.

4. Carrying costs > cash flow.

"Carrying costs" (cc) of the subject property are interest and taxes, both based on its own value. (Review INTRODUCTION for definitions).

$$cc = V(i+t) = a + gV \qquad (4)$$

Here, we are not distinguishing between interest on debt and imputed interest on equity capital, but lumping them together in Vi. Later we will separate them. As to Vt, that is always an explicit cash drain, for private landholders. (An interesting point, subsidiary here, is that public landholders, who are exempt from their own property taxes, should treat tV as an imputed cost.)

(4) brings out the central point that "a" alone is too small to cover carrying costs. The holder has to treat gV, the annual

appreciation of V, as a current receipt, just like cash, in order to cover the carrying costs. This is consistent with the Haig-Simons position that unrealized capital gains are current income, and indeed is the very sort of thing that led them to that finding.

If the land investment be financed 100% (either because of recent purchase, or later pledging as collateral) the cc are all cash outflows, and the outflow exceeds the inflow (a) by gV. The holder has to come up with cash of gV every year to pay interest and taxes. He has to raise the cash from some other source. He is thus buying the augmented land value each year, strange as that seems. Thus works the peculiar backward economics of real estate in a rising market.

It is always tempting to blame everything on taxes, and landholders faced with cash flow problems generally do so. But you cannot blame the cash bind shown in (4) on taxes: set t=0 and the problem is as bad as ever: worse, in fact. The problem is caused by gV, which doesn't go away when you eliminate taxes. Rather than go away, gV gets larger.

(If that seems to be done with mirrors, remember that lowering t has the effect of raising V, which accounts for the result. Remember, too, that we are lumping the opportunity cost of equity capital in with cash interest payments as part of cc. We refine that later. §8, "Negative cash flows", distinguishes cash drains from imputed interest on equity.)

What is a problem for some is a benefit for others, namely those who have surplus cash to keep on sinking into real estate or common shares while they rise. It is a benefit because it gives them a leg up on rival bidders who are cash-poor. An added benefit is that the rise of V is not recognized as taxable <u>income</u> (i.e. for personal and corporate income taxes, Federal and state) until and unless it is sold, and sometimes not even then.

<u>5. Dependence of tax on the interest rate.</u>

The property tax levy on land, T, is the rate, t, times the base, V. But the base varies inversely with the interest rate, i. Thus the tax bounces up and down as i bounces down and up. In the extreme i falls to zero, in which case the tax takes the entire rent, for any t>0. In fact it is only necessary for (i-g) to fall

to zero to get that result. In this §5, however, we simplify by setting g=0 -- it returns with a roar in §6.

$$T = tV = a\frac{t}{i+t} \qquad (g=0) \qquad (5)$$

(5) shows that rent (a) is shared between the fisc and the landholder according to the ratio of t to i. The absolute value of t means nothing by itself; its ratio to i is what determines the effective tax rate. The fisc gets Vt; the landholder gets Vi; and the sum equals "a".

It's not the simple ratio of t/i, either, but the one shown in (5). (5) shows, among other things, that T does not rise in proportion to t, i remaining constant. Doubling t does not double T -- try it if you doubt it, with a numerical example of your own. This is not due to any "wedge effect" or reduction of incentives or tax shifting: remember, we have assumed inelastic supply and no shifting of the tax. It is due rather to "tax capitalization".

"Tax capitalization", in turn, is an indirect way of viewing the fact that the property tax is based on the after-tax rent of land. This weakens the effect of raising the tax rate, because it eliminates part of its own base. To see this effect without the interposition of capital value, V, imagine that the income tax were based on after-tax, disposable income: a 100% income tax rate would then take just half of before-tax income. That is the way the property tax actually works, only the view is clouded because the effect goes through the capitalized value, V, which is the tax base. So when you hear "tax capitalization" think of a tax whose real bite rises a lot slower than the apparent rate.

This also has the result that the T/a is affected by a factor, i, other than t (and another factor, g, to be added in §6).

There are two ways to abate or remove these outside influences and control T/a.

One is to set t very high, so that T/a is nearly 100%, regardless of i. If (t+i) consists mostly of t, then changes in i have only minor proportional effects on (t+i). Changes in i are "diluted". Mathematicians might prefer to say that the logarithm of (t+i) grows insensitive to i when t/i is large. Say it any way

you like, but do see the point, we will be using it again.

Institutionally that may seem far-out today, but that is only because we are trapped in our little slot in space and time and don't look around very much. High values of t have been common in parts of California not long ago, and in other places too. Many economists regard a tax on land rents to be the most defensible of all taxes, on grounds of efficiency, equity, and macro-economic benefits. It is the oldest of all taxes, and it keeps getting revived. It may be the only one to survive through your lifetimes. So it is worth analyzing seriously.

A second way to control T is to set T independently, year by year, and then adjust t to raise T in the desired amount. This is the current practise in some American tax jurisdictions. This is why Herber calls the property tax a "residual" tax, one that is used to balance the budget. There is always a taxable surplus there, which the fisc relies on instead of borrowing to offset any cash deficit.

California today does neither. Prop. 13 fixes t=.01. Theoretically this rate could still tax away all of "a", should i fall to zero. That is unlikely, and certainly is not what Howard Jarvis intended. It is more likely, however, that (i-g) might approach zero, which would have the same effect. Read on!

6. Tax on current gV.

The property tax, being based on V rather than "a" alone, taxes gV as it accrues, something the income tax does not do. Solve (5) for Vt. You get one of these forms:

$$Vt = \frac{t[a+gV]}{i+t} \qquad (6,a)$$

or

$$Vt = \frac{ta}{i+t-g} \qquad (6,b)$$

or

$$Vt = a + gV - Vi \qquad (6,c)$$

Any one of those three forms (most obviously 6,a) tells you that gV is part of what is being taxed every year by the property tax. Not only is gV taxed, it is taxed comparably to "a", with no distinction. This is a distinctive feature of the property tax which sets it sharply apart from most other taxes. It is because the property tax base is V, and V is affected by g. "g" is invisible to other kinds of tax base definitions, and either escapes taxation or enjoys deferral. (Taxes are something like justice: "Taxes deferred are taxes denied.")

Another way of viewing this same effect is that the tax rate, t, is a real rate; while the real interest rate is (i-g). Where g is due entirely to expected inflation, this effect is entirely as described here. And "a" is divided up accordingly. The fisc gets tV each year; the landholder gets (i-g)V. That is:

$$tV - a = (i-g)V \qquad (6,d)$$

Thus in an inflationary period t is mightier than it appears, relative to i. To gauge the strength of t do not compare it to i, but to i-g.

7. Carrying costs independent from tax rates.

A. g=0.

When g=0, cc are always "a", at any t.

$$cc = V[i+t] = \frac{a[i+t]}{i+t} = a \qquad (7,a)$$

We saw in §6 that as t rises a larger share of "a" goes in taxes. The tax share is t/[i+t]. The other share goes to the landholder. But the sum of the two remains the same, and equals "a".

B. g>0.

Here we get the interesting result that raising t

actually lowers cc. Use (3,b) for V, and find cc:

$$cc = V[i+t] = \frac{[a+gV][i+t]}{i+t} = a + gV \qquad (7,b)$$

(7,b) shows that cc fall when t rises. Can you see how? It is because V is a decreasing function of t, i.e. V falls when t rises. I don't know if this result is counterintuitive in any absolute sense, but it is certainly counter to conventional belief, which gets molded by the economic interest of landholders.

(7,b) is, by the way, the same as (4). We just came at it by a different route, with a different emphasis.

Raising t does <u>not</u> lower T, because ln(t) rises more than ln(V) falls, so the sum of the logs rises, meaning the product of tV rises. gV falls, but t takes a higher share of both gV and a. For very high t, gV approaches zero because V approaches zero, g remaining the same. Thus the influence of g on V is reduced or eliminated, even though g remains the same. But then T soaks up all of "a", which is the upper limit.

How do we know that "a" is the upper limit of property taxation? We know that cc can exceed "a". But go back to Eqn. (1) and multiply by t. The ratio t/[i+t-g] rises to a max of one as t rises very high (so long as i>g).

T>a still does happen in practise because some landholders are not putting their land to its highest and best use, and some assessors are valuing it at market value based on highest and best use. That issue (which is important) is not treated in these notes. It has causes which are excluded by our simplifying assumptions. Something is always left as a challenge for the next generation -- aren't you glad?

The primary effect of raising t (other than to collect more taxes) is to reduce the landholder's need for cash to finance gV every year, as explained in §4. That's assuming the landholding is 100% financed. But what if it isn't? Read on!

<u>8. "Negative cash flow".</u>

It is common for investors to "finance" their holdings, i.e.

to buy or hold with borrowed money. "Cash flow" is normally defined, then, as our "a" less the cash outlay on carrying costs. Vt is usually a cash outlay (not always because some people let unpaid taxes pile up, in effect borrowing from the county). I'll treat it here strictly as a cash outlay.

If the holding is 100% financed then Vi is all cash, too. In that case, with g>0, net cash flow (ncf) will always be negative.

$$ncf = a - V(i+t) = -gV \qquad (8,a)$$

The negative value of ncf has to be put in from some other source each year. In effect the investor is buying the annual growth of V each year with outside cash.

Normally the holders of equity positions in assets cannot finance them 100%. Let "s" be the share of V which is self-financed, so there is no cash outlay on it, but only "imputed" or "opportunity" interest.

$$ncf = a - V(1-s)i - Vt = a - V(i+t) + sVi$$

Substituting from 8,a:

$$ncf = sVi - gV = V[si-g] \qquad (8,b)$$

Cash flow is negative whenever $si<g$.

During the real estate boom of 1975-81 it was routine that investors accepted negative cash flows. "Just plan to raise rents 8% a year to keep up with inflation" is what the boomers told the buyers. With equity (s) of 20%, i=15%, and values based on g=8% the new investor began with a large negative cash flow.

9. t as upper limit on V.

In some years since inflation became a way of life there is talk that the real interest rate might be negative, meaning that nominal rates are less than inflation rates. In the absence of property taxes that would be logically impossible, because zero real rates mean infinite land values. But with t>0 it is another story. Let i=g (meaning real i.r. of zero) and:

$$V = a/t \qquad (9)$$

There is still a possibility of negative real i.r., with g>i. What is logically impossible is that g>[i+t].

10. Finding the real interest rate.

The foregoing logic gives us a means of finding the real interest rate, i-g.

$$i-g = a/V - t \qquad (10)$$

In California recently a/V has been around 4% and t around 1%, for a real rate of around 3%. That is very crude, so don't engrave it on stone yet. Because future g comes not just from inflation but from real rent increases, i.e. rents that rise faster than the general price level. We have to sort that out, which is not attempted here. But still, (10) takes us a big jump ahead of where most people are on this tricky question.

The trick that makes this work is that t is a real rate, i.e. it is based on V, and V is reassessed regularly to keep up with inflation. "i", by contrast, is a nominal rate, based on a fixed cash loan whose real value declines as inflation proceeds.

11. Leverage of i on V: raised by g; lowered by t.

Begin without any g or t, but just simple capitalization, so V=a/i. The elasticity (E) of V w.r.t. "i" is now minus one, meaning that an x% rise of i causes an x% drop in V.

It is convenient to restate that this way: the negative E of V w.r.t. "i" is one. You will soon see why.

Do not be misled by the ambiguity in writing of "an x% change of i", because i is itself a percentage. A rise of i from .04 to .05 is a 25% rise, not a 1% rise.

Ok, now what if V=a/(i-g)? This means leverage where i is the handle, g is the fulcrum, and V gets the action. A rise of i from .04 to .05 now raises (i-g) by more than 25%, and a lot more if g=.04 itself. And the negative effect on V depends on the fractional change in (i-g), not just the change in i alone. (Puzzled? Work out a numerical example, it's quick, easy and

persuasive.)

More generally we can put that in terms of the elasticity (negative) of V w.r.t. "i". With some elementary differential calculus (which I leave to you) you can show that:

$$-E = \frac{i}{i-g} \qquad (11)$$

That means that when g gets up near i, V gets hypersensitive to i. Try, for example, i=.12 and g=.09. Then -E=4, so a 10% drop in i creates a 40% rise of V. We are dealing with dynamite! There are a couple of ways in which this dynamite can blow up in the face of economic efficiency and stability.

One way is through the amplitude of swings in V over the course of a business cycle. "Under all the land" says the Realtors' motto, and it connotes stability. Physically, yes; economically, anything but. The history of boom and bust in land values overmatches any other in terms of amplitude of change. This is unstabilizing for a variety of reasons, not least of which is the heavy dependence of bank credit on land value collateral, and not just farm land -- farm land is a small part of the land value on which banks have loaned, and based our money supply.

Second is an allocational matter. Access to credit is uneven: a lucky few have no need to borrow, some borrow at the prime, some at higher rates, some from their friendly local Mafia juice man, and some not at all. Those with the lower "internal" rates can have their pick of the land for sale. Those with poor credit can hardly enter the land market at all, except as renters. What looks like a small difference in the borrowing rate, i, makes a vast difference in what the individual can bid for land.

12. Dilution of i by t.

Everything said in §11 about the effect of g can now be said in reverse about t. Because g is subtracted from i, and t is added to it. Eqn. (11) may be rounded out by adding t, for the whole picture.

$$-E = \frac{i}{i-g+t} \qquad (12)$$

Where g magnifies the effect of i, t dwarfs it. Thus t reduces the amplitude of cyclical swings in V; and it counteracts the discriminatory effect of differential access to credit.

13. Dilution of i by negative g.

Everything said in §11 about the effect of g can be said in reverse about negative g. What is negative g? Depreciation. What depreciates? Most true capital, which wears out and obsolesces.

Of course there are many depreciation paths, and the one described by negative g is just one of them. Still, for a short way to contrast the effects of i and t on depreciating capital and appreciating land you could hardly do better than change g from positive to negative.

****

All those 13 points come from Eqn. 1. That is a lot of milk from one cow, and there is more in her yet. But this is not an encyclopedia, just a solid introduction to the strange, and strangely neglected economics of our most important asset, land.

Econ. 132, Wednesday, 3 Feb 99

Main points to learn from notes on "Rising Rents," pp.1-6

On Monday, 1 Feb, you were baffled by several pages of new material that are hard to read. Sorry, my fault, I thrust it upon you with no warning or preparation. Here are two aids to help you learn the material, and organize it in your mind, and retain it, and keep it "on call" so you can retrieve it when you need it.

First is a list of the main points you need to learn from pp. 1-6. (Note, this covers pp.1-6 only; another list will follow.) Any exam questions on pp.1-6 will be limited to these main points.

Second is a catalogue of all the terms we had to discuss. This discussion may have seemed digressive, but we needed it because some of the terms are strange and new to some of you. Many of them are terms you will need to know, to understand the main points. All of them will come up again in this course, so I take this opportunity to introduce you to them.

A. 13 main points

1. The model given is oversimplified, to introduce you to the subject with the least pain and digression and complexity. Key on the equations, to help sum everything up, but also learn the lingo.

2. Growth expectations are capitalized into present values (PV). (PV is aka Discounted Cash Flow, or DCF.)

Growth expectations, g, are partly subjective. They vary with individuals, and are swayed by mob psychology as "balloon economies" boom and bust. Do not let the comforting precision and rationality of mathematics hide this from you.

The rent that is capitalized into value, V, includes "imputed rent" from owner-used lands.

Both imputed rent and unrealized accruals are "invisible" because they do not take the form of current cash.

Both of them are exempt, in whole or in part, from income tax. The IRS keys in on cash receipts. (We will see that the only tax to tap these forms of income is the property tax.)

3. The most common source of rising cash or service flows is land, because it lasts forever. Most man-made capital depreciates.

4. Rising rents result in regular annual increments to PV. These are a form of current income. The IRS ignores them until and unless the owner sells the asset for cash, at which time these increments are called "capital gains," and may be taxable (subject to many loopholes). (We will see later that the property tax has the effect of taxing them currently, year by year, as they accrue. This is a major difference in the impact of those two kinds of taxes.)

5. PV is the sum of a geometric progression, as shown. Simplifying this sum to one short expression, PV is the current annual cash flow, a, divided by the "cap rate."

a. The simple cap rate is "i".

b. A more complete cap rate is [i-g+t]. See notes for definitions of i, g, and t.

c. The P/e ratio is the reciprocal of the cap rate. ("e" is for "earnings," originally referring to the income per share of common stock. I use it here as analogous to "a", the annual rent of land.)

6. "Tax-capitalization" lowers PV; growth-capitalization raises PV.

J.S. Mill's error was to overlook the second point.

7. Growth expectations, g, exert heavy leverage on the cap rate.

A. This makes values volatile.

B. This screens out individual buyers who lack equity and/or good credit ratings. Play with some numerical examples until you are sure you understand how this leverage works.

8. The property tax is unique among taxes in that its base is the value of land after-tax (the income tax base, on the other hand, is income before tax).

9. The effective rate of the property tax depends not just on the tax rate, but on the interest rate. The effective rate varies directly with the tax rate, t, but inversely with the interest rate, i. This is a peculiarity of the property tax because it is based on V, not a.

10. Arbitrage equalizes the yields on different investments. "Yield" means the e/P ratio (reciprocal of the P/e ratio).

A. The adjustment takes place in the PV of the assets (V, in these notes, and P in the P/e ratio) not in their income streams (a, or e). (If this is counterintuitive for you, you need to focus on the matter until you shall have corrected your perception - it's important.)

B. The "yield" that arbitrage equalizes includes the invisible and speculative income from future increments to rents, so the visible yields may not be equalized. Assets with "growth" prospects (whether common stocks or lands) will appear to yield less. Lands in states with high property tax rates (like New Hampshire) will appear to yield more than lands in low property-tax states (like Alabama).

11. The basic valuation formula can be rewritten (Eqn. 3,a) to look as though buyers are capitalizing annual increments the same as they do cash rents, "a". (Cash rents are aka "ordinary" income.) This confirms the "Haig-Simons" definition of income wherein current increments are part of income, the same as ordinary cash income.

12. Financial "carrying costs" (cc) of owning durable, appreciating assets equal the sum of cash flow (a) plus the current value increment, gV. To justify paying such costs, the owner must regard gV as current income, worth just as much as current cash income. This confirms the Haig-Simons concept of income, in which unrealized capital gains are just as real, in the year they accrue, as cash income.

13. If an owner finances a durable asset with debt, 100%, she will experience "negative cash flow" equal to gV. gV is what compensates the owner for that cash drain: she is, in effect, buying and paying for it each year with the cash drain. The cash must come from some other source than the subject asset.

In rising markets, "negative cash flow" is quite common. A few years ago it was the greatest income tax shelter.

****

B. Rising Rents, Key Terms and Usages

Be sure you know these terms and their usages in Public Finance. They will serve you well. Every field has its distinctive professional lingo. When you learn the meaning of the terms, you accomplish half the job of learning the subject.

The terms below all came up just in the discussion of pp.1-6 in the notes on Rising Rents. You won't have to learn this many new words per page in the future, because once you learn them, we will use them again and again.

You could learn the essence of the "rising rents" paper with less than 100% of these terms, but they all arise here, and this is a good time for you to learn them. You learn half the things

you need to know in this world by "serendipity" (i.e., they come to your attention while you are focusing primarily on something else).

If you are unsure of any meanings, ask for help NOW, either in class, or my office, or by email (mgaffney@ucr.campus.mci.net).

accrual of value
amortization
appreciation
arbitrage
balance sheet
base (of a tax)
capital gain
capitalization rate ("cap rate" for short)
capitalization (of a flow value into a point value)
capitalization of growth expectations
capitalized value ("capital value" for short)
carrying costs (of holding title to land)
cash flow (or stream)
common stock (shares)
compound rate of growth
constant dollars
current dollars
debt service
depreciation
discounted cash flow (DCF)
disposable income
economic life
equity
flow value
fractional growth rate
geometric progression
Haig-Simons income
impose (a tax)
imputation (assigning part of revenues to specific inputs)
imputed income
income tax (inctax)
income
income statement
income property
increment to value
inflationary growth
land
leverage

levy (v.)
lump-sum
Mill's error
Mill's proposed tax
negative cash flow
net product
nominal interest rate
ordinary income
P/e ratio
perpetuity
point value
present value (PV)
price/earnings ratio (P/e)
profit
property tax (proptax)
real growth
real estate
real property
real interest rate
recognition of income
rent
service flow
tax capitalization (of a property tax)
tax shifting
time zero
unearned increment
unjust enrichment
unrealized accrual
unrecognized income
usufruct
valuation
windfall gains
years' purchase (English)
yield (the e/P ratio)

To learn the above terms, and how to use them, play with them, and test yourself as though you were in a quiz show.

A. Which terms are paired (as opposites, or complements, or significantly different while superficially alike)?

inflationary growth vs. real growth
unrealized accrual vs. recognized income
service flow vs. cash flow
point value vs. flow value
cash flow vs. income

balance sheet vs. income statement
land vs. real estate
profit vs. net product
imputed rent and unrealized accruals (both are non-cash)
recognition and realization
appreciation vs. depreciation
etc. - over to you

B. Which terms are synonyms, or closely related?

imputed income and service flow
balance sheet and point values
unrealized accrual and Haig-Simons income
present value and DCF
years' purchase and P/e ratio
usufruct and income
lump-sum and point value and up-front value
yield and P/e ratio (they are reciprocals)
unearned increment, windfalls, capital gains

C. Which terms have more than one meaning or nuance, varying with the context or the speaker? (These confusions arise because language is the joint creation of millions of people, who do not always check with each other before coining terms. This enriches and adds interest to the language, but may also confuse you. Also, many people misuse words, and bad usage may be contagious. Worse, some people deliberately foster confusion to promote their goals, to cover malfeasance, etc. - sorry, but it's an imperfect world, deal with it.)

capitalization
lump-sum
rent
income
profit
equity

If there are nice distinctions between the terms, learn and prepare to explain them