Land Gains, Fast Write-Off, and Incentives to Build

By Dr. Mason Gaffney

Article citation:
Gaffney, Mason. "Land Gains, Fast Write-Off, and Incentives to Build." *23rd Annual Conference*, Committee on Taxation, Resources and Economic Development, 14 October 1985, Cambridge.

LAND GAINS, FAST WRITE-OFF, AND INCENTIVES TO BUILD

For delivery at Conference of TRED, Sept. 13, 1985; revised, Oct. 14, 1985

Mason Gaffney

Introduction

Once upon a time each building was written off from taxable income over something purporting to approximate its economic life. Then Congress and the industry began implementing the Commons variation of the George principle. They began shortening tax lives and steepening the gradient of depreciation paths. The light broke on most of us with the speed of a crepuscular Yukon sunrise, but finally it dawned that this was turning the income tax into a sort of "graded tax plan" whereby the income from depreciable buildings was taxed at a lower rate than the income imputable to (or derived from) non-depreciable land.

The movement accelerated with Walter Heller, the soaring sixties, and the Kennedy era when "conservative Keynesianism" was in flower. It offered a consensus that seemed for a time to reconcile the polarities of the previous generation at a convivial Table Round in the New Camelot. Georgists were also being patronized at the local level in their correlative efforts to untax buildings and update land assessments, but local progress was halting and grudging. The action was in Washington.

The movement peaked when the chant of "10-5-3" pierced the Potomac vapors -- was it really 12 years ago? This merely arithmetical slogan was as territorial and overreaching in its way as "54-40 or Fight!", but buildings actually did get 15 year lives for quite a while, and 18 years is now common (but not uniform -- is anything anymore?).

The results, or at least the ensuing events have to get a mixed review. We have built up the largest surplus of office space in world history. The surplus is wasting billions in capital which has higher uses elsewhere, but that is not the worst of it. With the surplus we have destabilized the macro-economy and the banks. The vacant space constitutes one of the most fragile and perilous elements of collateral behind bank loans. It perhaps outdoes farm loans, energy loans, shipping loans and foreign loans in its contributions to recent bank failures and hazards.

We have managed to magnify investment opportunities in a "conservative-Keynesian" way without however solving the problems of unemployment, homelessness, malnutrition, poverty, bad education, unaffordable medicine and so on. We cannot even rev up the macro motor to get out of an extended period of "slack business" (the pre-Keynesian euphemism) or "slower growth" (the current one).

Evidently there is more to tax reform than just protecting certain kinds of buildings and fixtures from the full fury of the rates. Come to think of it, it is a left-handed sort of benefit to workers to have wages taxed higher so that capital in buildings and machinery may be taxed lower. It is of doubtful macro-economic benefit to divert limited capital from circulating inventories to fixed forms, or so the classical economists taught. Even 10-5-3 offered nothing to encourage investment in inventories, the working capital required to stock new buildings and "advance subsistence" to workers (as Smith, Ricardo et al. put it). Today's equivalent of "advancing subsistence" would be supplying the market with consumer goods and holding down inflation.

So, without any assumption as to good or bad, let us look at the effects of tax life on the incentive to invest in buildings. In their disenchantment our leaders are now proposing to lengthen tax lives from 18 up to 28 years, so we will look specifically at those numbers, as well as some other benchmarks.

A. Defining Rate of Return after Income Tax (RRAT)

Our method is to find the rate of return after income tax (RRAT). "Tax" here means only income tax; property taxes are not analyzed in this paper. I choose RRAT instead of present value because RRAT is standardized for different periods of time. Another acceptable approach would be to use the annual value of an investment, but that is not calculated here. It would be a useful exercise to recalculate the findings in terms of annual values, and see to what extent that changes anything. It could cause minor changes in the relative weight of different factors, but basically taxes drive a wedge between income before-and-after taxes, whichever technique is used to express the effects.

RRAT is calculated from Equation (1), below. (1) is basically the standard formula for finding the yield-to-maturity of a redeemable bond which has both a periodic coupon and a redemption value. This fits the case of a building which yields both a periodic cash flow and a resale value. The equation is modified to show the effect of taxes.

$$RRAT = \frac{\frac{a}{P}(1-t)(1-I^{-n}) + \frac{t}{x}(1-L)(1-I^{-x})}{1 - \frac{F}{P}[(1-s) + Ls]I^{-n}} \qquad (1)$$

where a=cash flow before taxes
P=present cost of building plus land
t=tax rate on ordinary income
I=1+i, where i is the same as RRAT
n=years before sale
x=tax life
L=land element (non-depreciable) as a fraction of P
F=future sale price after n years
s=tax rate on capital gain

(1) does not purport to be a global comprehensive statement of all relevant factors. It leaves out the investment tax credit; depreciation paths other than simple straight line; recapture provisions; risk and uncertainty; leverage from debt; property taxes; the effects of inflation; and no doubt other points, each of which is of overarching significance to someone. The purpose of course is to simplify by omitting lightweight and peripheral elements.

I hope that others who see the need for adding other factors to (1) will do so and improve on the present work. It should be straightforward to add other elements to (1), and elaborate on and develop the procedures used below. The present purpose is just to get well started by putting the basic elements in a sound framework. William Wheaton, Jr., has suggested that inflation is the additional element most needing explicit treatment.

(1) was cast in its present form by dividing top and bottom by P. I suggest that readers undo that step by multiplying top and bottom by P. They might go further back and solve for P, which gives the present value formula from which I began before solving for RRAT. This will help see where (1) came from, and overcome some possible confusions. The present form is a little more compact and useful in the long run, although that is a judgment call which some may dispute. If so they are encouraged to do it their way, and see if the results differ in any important way.

I have given to each of the parameters a "default value": a value to which it reverts in default of any other specification. The "default values" of the parameters are:

a/P=.12
t=.5
n=x
L=.4
F/P=1
s=.2

The reason for having n=x is that a building owner has much to gain by selling as soon as depreciation runs out, letting the next owner redepreciate from a new basis. This presupposes a certain slippage in allocating basis between land and building, a point to be explored.

n may also be used as the year in which we choose to end the analysis, without any sale. In this case F means the market value of the real estate after n years; and s=0. Many owners choose to forego sale to avoid s, even though that means foregoing the higher sale price that can be offered by a buyer who can redepreciate.

The tax code of course actually applies the same rate to capital gains as to ordinary income, but reads that 60% of capital gains are excluded from taxable income. That argues for using .4t in lieu of s. However "capital gains treatment" involves a whole package of benefits, not just the 60% exclusion. For that reason I am keeping the separate notation, which allows us the flexibility to contemplate different ratios than .4. When you consider the whole picture, .4 is generally too high.

Solution of (1) has to be an iterative process, since RRAT appears on both sides of the equation (hidden in I on the right side). In the primitive times of our youth the process could be slow and laborious, even using Newton's ingenious method. Now it can be done automatically with nothing fancier than a hand calculator like the HP38E, or the newer HP12, or various other models. It can also be done surprisingly quickly by trial and error by programming the right side into any good programmable calculator and trying various values. A computer does it in a flash. I prefer the calculators, which are fast enough to be easy and slow enough to let you think what you are doing.

B. Anticipation by Inspection

Inspection of (1) lets us anticipate and outline our findings, (which are to be illustrated later by numerical examples). Mathematical purists might opt instead for taking derivatives, log derivatives, and ratios of log derivatives, and we encourage them to do so. But to this writer that seems like mathematical overkill which would add more to length than clarity in treating the present subject.

1. Tax life (x), taken by itself (i.e. with n constant), has only a muted effect on RRAT. The second term in the numerator contains x twice. The numerator is a decreasing function of the first x, and an increasing function of the second x, which thus offset each other. The first x is the more powerful so that the whole function is decreasing, but too slowly to do much compared to other variables.

This means that a short x is not of great impact in the absence of timely resale, and points to resale timing and resale tax treatment as the more heavyweight factors.

The effect of x is muted again when there is a high value of "L", the non-depreciable land share. For more on this point, read on.

2. The marginal RRAT (from an increment to building volume

or quality on a given site) entails a marginal land input of zero, and is calculated by setting L=0. This raises the sensitivity of RRAT to x. Here we are talking about variable proportions: more depreciable capital applied to a given site. A lower x does encourage intensification, although we will see the stimulus is weak, except to one particular kind of investment.

This heightened sensitivity of RRAT to x is offset, however, when we consider that F/P is lowered by adding inputs which are 100% depreciable. The appropriate F and P values here are those of the marginal increment to capital investment, with no land value included at all.

Lowering F/P raises the denominator and mutes the absolute effect on RRAT of changes caused by x in the numerator. Relative effects on RRAT are little affected, but the effect of x on the marginal RRAT is reduced relative to the effect on the average.

A most important exception here is when the marginal investment is specifically geared to raise F, as opposed to raising a. It is useful to group incremental investments in three classes, according to the major effect: to increase floor space; to increase quality or specialization; and to increase economic life and/or resale value. Most investments are not purely for one or another but differ in degree, and there is a constant trade-off between increasing a and increasing F. A short tax life creates a bias for trade-offs that favor F.

3. Now we let n vary, with x constant, and F=P. That brings resale into the picture as an active influence on RRAT. RRAT now becomes quite sensitive to x (as a decreasing function). When we assume that F/P is constant, we mean it is unaffected by the time of sale. This implies that land value appreciation is offsetting building depreciation. Lowering n is now an effective way to raise RRAT, so long as x is low.

The reason such an assumption is realistic is because F is raised by the buyer's future ability to redepreciate; and the lower is the value of x, the greater is that benefit. The value of that benefit is greatly enhanced by the general IRS practise of letting enhanced land value be depreciated also.

The redepreciability of resold buildings and much of the land value under them sustains a strong demand for them.

Justifiable tax lives get shorter, logically enough, as buildings get older and approach demolition. Allowable depreciation <u>paths</u> are somewhat decelerated, it is true. But this factor is of so little weight that many, perhaps most building owners always use simple straight line anyway, just to avoid the harassment and aggravation of recapture when they in turn sell. Only the excess above straight line is subject to recapture, and the benefits of DDB without recapture are realized by getting a low x. This is why I left both recapture and accelerated depreciation out of the model. The important elements are tax life (x) and the depreciable share (1-L).

In a more formal and complete model we would follow this through infinite time, and it would then be obvious that a lower value of x lets you depreciate more times per century (or other fixed time period). In the present model, however, we subsume all that in these heuristic observations about probable effects on F, as seen from the perspective of the first-generation holder. By virtue of its flexibility this approach is more true-to-life than total modeling, anyway. F is dominated by expectations, which in real life include hopes, fears, and the fads of seers, concerning which a page of history is worth a volume of models.*

4. With low values of x and n, RRAT becomes very sensitive to F/P, and also to s and to L. Thus the effect of x on incentives depends mainly on resale values; on tax treatment of capital gains; and the share of basis which is depreciable. These become more important than ordinary income and tax rates.

It also becomes much more important how much of basis you write off than when. That is, understatement of the land value share is a larger loophole than fast write-off. A weakness in our model is that it shows this point explicitly only for the period before resale, when in fact the overallocation of basis to the building mainly occurs after resale, and in our model is reflected simply in a higher F. We leave the reader to reason this through -- it is not explicit in L, but implicit in F.

---

*A good present value model spanning an assumed 70-year life is in P. Hendershott and D. Ling, "Prospective Changes in Tax Law and the Value of Depreciable Real Estate", AREUEA Journal 12:297-317 (1984). But their focus is very different from that here: they hold land value constant over 70 years.

In an ideal world F would be less than P by the precise amount of depreciation actually taken, resulting in a neutral tax. In our real world F is affected by 1) Future residual building value; 2) Future land value; 3) Future residual tax shelter value; 4) Future financing conditions at time of planned resale. (1) is generally greater than P less cumulative depreciation because of overdepreciation. (2) is chancy and fluctuant, sometimes wildly so, and has in the past figured in many cycles of boom and bust before 1929, even in the absence of the additional uncertainty from (3). (4) is also highly unstable and unpredictable. In our times heavy tax rates on incomes have added to the brew the factor of (3), which is probably not as wild as (2) or (4), but which magnifies their influence on the RRAT.

5. The sensitivity of RRAT to a/P declines as x and n decline; and as t increases (s remaining constant). This is to say that the ordinary income of a building -- the thing that economic theory says should provide the incentive to build it -- declines to a secondary factor in the equation.

6. The sensitivity of RRAT to t declines as x and n decline (again, s remaining constant). In the example to be given the effect of t on RRAT is even perverse for values of x less than 7, amazing as that may seem. The mathematical reason for this is seen by collecting the terms which contain t, with n=x. RRAT becomes an increasing function of t when $x < (1-L)P/a$.

7. The sensitivity of RRAT to L rises as x falls. This is because (1-L) in the numerator of (1) is divided by x. This effect is muted by the muting of the effect of x itself (cf. #1, above), only less so because L is also in the denominator, where its force is magnified by a lower value of n, where n=x.

The main opportunities to inflate RRAT by understating L are not in the primary market. The builder's depreciable basis is what he spent on construction, however little value he may assign to his land. There may well be minor scams in the primary market, but the massive, routine, institutionalized underreporting of L is in the secondary market, in the second and later rounds of depreciation. Through arbitrage, most or all of this gain is shifted to the primary builder. The mechanism of transfer is a higher F paid to the primary builder by the first buyer.

C. Numerical examples of the sensitivity of RRAT to the parameters discussed in Part B, above.

Here we illustrate and support the findings in Part B, using numerical examples. Such examples are not formally general. In my judgment, however, based on intimacy acquired working with Eqn.(1), the examples given below are representative, and give us a good and fair insight into the relative importance of the parameters.

The numbers of the points below correspond to those in Part B.

1. Here we depart from our default assumption that n=x. We hold n=50 while x varies. This shows the pure effect of fast write-off without sale after x years. A sale is assumed at n=50 at a price F=P; but F=0 would not lower RRAT much, when n=50.

In order to walk us into the procedure, Table 1 shows more steps than will be shown in later tables. It shows how to adapt (1) for solution on the HP12. This calculator requires one to divide the cash flow into as many parts as there are different levels of cash flow, in this case 3 parts, called PMT A, B and C.

PMT A is the sum of (a/P)(1-t) (which is [.12].5=.06) and t(1-L)/x (which is [.5].6/x=.3/x). PMT A extends for the first x years. Its second part is the annual depreciation write-off, multiplied times the tax rate.

PMT B is just (a/P)(1-t)=.06, and extends for the next span of years, 50-x. This is the after-tax cash flow after the depreciable basis is exhausted.

PMT C is .88F/P. PMT C represents sale at the end of 50 years. PMT C occurs only once, but it represents the present value, at time of sale, of the old building and the land over all future time. .88 is the tax factor in the denominator of

(1), using our default values. (.88 means the taxpayer keeps 88%; the fisc gets 12%).

When programming a solution for calculator or computer it is not necessary to follow the exact procedure shown; but any procedure that breaks (1) down into its components is useful in helping one grasp the forces at work.

Table 1: **RRAT (%) with different values of x, with n=50**

x	.3/x	PMT A	PMT B	PMT C	RRAT(%)
5	.060	.1200	.06	.88	7.92
10	.030	.0900	"	"	7.57
15	.020	.0800	"	"	7.32
18	.0167	.0767	"	"	7.20
28	.0107	.0707	"	"	6.91
50	.0060	.0660	"	"	6.57

The effect of changing x, shown in the right column, is too modest to concern anyone deeply.

2. Table 2A shows how the effect of x on RRAT is greater at lower values of L. L=0 shows the effect on the marginal RRAT. The "marginal RRAT" is the marginal return imputable to a marginal input of capital, with fixed land (see Part B, Section 2, above). Table 2A overstates the sensitivity for most cases when L=0 because a low L implies a low value of F/P, and the Table values are based on a constant F/P=1. However, investments in longevity, that sustain F, are indeed favored as shown. While the bias shown is still not overwhelming it does point us in the right direction, as will appear when we discuss early resale, coming up next.

Table 2A: **RRAT (%) for different values of x and L, with n=50**

L \ x:	5	10	15	18	28	50
.0	9.73	8.88	8.34	8.10	7.55	6.95
.4	7.92	7.57	7.32	7.20	6.91	6.57
.9	6.27	6.23	6.20	6.19	6.15	6.15

Table 2B shows how the sensitivity rises when n=5, so that early resale is a prime force.

Table 2B: **RRAT (%) for different values of x and L, with n=5**

L \ x:	5	10	15	18	28	50
.0	12.91	10.77	9.49	8.92	7.63	6.15
.4	10.03	8.95	8.22	7.88	7.07	6.10
.9	6.65	6.51	6.41	6.35	6.21	6.02

3. Table 3 illustrates how the resale date changes RRAT, for any given value of x. This shows that the sensitivity in Table 2B depends on the early resale date, n=5.

Table 3: **RRAT (%) for different values of n and x (L=.4)**

n \ x:	5	10	15	18	28	50
5	10.03	8.95	8.22	7.88	7.07	6.10
20	8.21	7.77	7.45	7.30	6.93	6.49
50	7.92	7.57	7.32	7.20	6.91	6.57

Table 3 read across shows that sensitivity to x requires a low value of n, i.e. a quick resale. But when read up or down it also shows only a moderate sensitivity to n, even when x=5. There is a tax on sale, even though at a reduced rate, which removes some of the gain from churning to redepreciate. This is the impact of the "locked-in effect", an effect too weak to dominate RRAT but strong enough partly to offset the stronger effect of the gain from redepreciation. When x=50 the locked-in effect actually does dominate.

This last effect brings out a point hitherto uncelebrated here, that the maximum uplift to RRAT comes from achieving the gain while avoiding the gains tax (s) altogether. One way to do so is simply not to sell, but use the enhanced real estate one's self. Many taxpayers do follow this strategy.

But then one sacrifices redepreciation to avoid the tax. The buyer gets the redepreciation but shifts part or all of the gain to the seller in a higher F, so maximizing joint avoidance is the best strategy. One does best by having s so low, or avoidable in other ways, that there is no need to avoid sale and forego redepreciation.

4. To find the dynamo of builder incentive we now examine the capital gain, measured by F/P. Table 4A shows the sensitivity of RRAT to F/P when x=5, for different values of n.

Table 4A: **RRAT (%) for different values of F/P and n (x=5)**

F/P \ n:	5	10	20	40
1.0	10.03	8.83	8.21	7.95
1.3	14.17	10.62	8.82	8.07
2.0	21.85	13.89	10.00	8.33

Note how a 30% increase in F/P causes a 42% rise in RRAT, when n=5. Now for the first time we see high sensitivity of RRAT to a parameter. Future sale value, F, is clearly a prime mover. This is true even though the gain is taxed; the next table shows how the gain rises if it be taxed less, or not at all.

Table 4B shows the sensitivity of RRAT to s, with n=x=5, and L=.2. The Table also shows the rate of return before taxes (RRBT). I am lowering L to .2 here to make a point, as will be seen.

Table 4B: **RRAT (%) for different values of s and F/P (L=.2)**

F/P	RRBT	s: .0	.1	.2	.5	.8	1.0
1.0	12.00	14.00	12.76	11.45	7.04	1.60	-2.99
1.3	16.34	18.18	16.80	15.36	10.43	4.22	-1.15
2.0	24.35	25.96	24.37	22.67	16.86	9.36	2.60

Here we see extreme sensitivity to s. The preferential rate on capital gains in tandem with fast write-off and fast turnaround is more powerful than anything we have seen before here. It is so powerful that when s is .1 or less, RRAT>RRBT. RRBT is shown in the second column. This is more than total avoidance; it turns a tax into a subsidy.

This is the point to make which I lowered L to .2. This effect is the joint result of deducting depreciation from ordinary income while qualifying most of the gain for the lower tax rate, s. The effect is stronger when L is lower, which means for marginal increments of capital, and also for owners in the secondary market who understate L in order to depreciate land. For more on this cf. Section 7.

Table 4C gives a more complete and balanced, if somewhat multidimensional picture of how three variables affect RRAT. It contains beside the main points stressed here yet other nuances and cross-currents, and will repay careful study.

Table 4C: **RRAT (%) for different** s, F/P, and L

F/P	L	s: .0	.1	.2	.5	.8	1.0
1.0	.4	12.00	11.04	10.03	6.77	2.97	0.00
"	**.2**	**14.00**	**12.76**	**11.45**	**7.04**	**1.60**	**-2.99**
1.3	.4	16.34	15.27	14.17	10.54	6.28	2.95
"	**.2**	**18.18**	**16.80**	**15.36**	**10.43**	**4.22**	**-1.15**
2.0	.4	24.35	23.13	21.85	17.63	12.62	8.63
"	**.2**	**25.96**	**24.37**	**22.67**	**16.86**	**9.36**	**2.60**

5. Table 5 shows the sensitivity of RRAT to ordinary cash flow, a, for high and low values of n and x. The sensitivity is damped when n and x are low, showing that RRAT is then dominated by factors other than cash flow. (To understate the point I reduced L to .2 in Table 5, but it makes little difference.)

Table 5A: **RRAT (%) for different a/P and n (x=n, L=.2)**

a/P \ n:	5	20	50
.04	7.23	3.43	2.64
.07	8.82	5.02	4.20
.12	11.45	7.64	6.76

With n=50, RRAT tracks a/P closely, as you would expect in a neutral tax system. But with n=5, RRAT is much less sensitive to a/P. It is distracted by resale prospects, which have displaced ordinary cash flow as the strongest power driving investors in buildings.

Table 5B shows RRAT as a function of 4 variables: a/P, L, n, and x. Like Table 4C it is a multi-dimensional study in which the reader can follow the interplay of several shifting parameter relationships.

Table 5B: **RRAT (%) for different a/P, L, n and x**

	n:	5	10	10	20	20	50	50
	x:	5	5	10	5	18	5	18
a/P	L							
.04	.1	7.93	5.74	5.07	4.46	3.70	3.64	3.22
"	**.4**	**5.86**	**4.33**	**4.00**	**3.48**	**3.10**	**2.95**	**2.75**
.07	.1	9.52	7.54	6.68	6.41	5.32	5.78	5.02
"	**.4**	**7.43**	**6.03**	**5.57**	**5.26**	**4.68**	**4.83**	**4.45**
.12	.1	12.18	10.50	9.33	9.61	7.99	9.23	7.87
"	**.4**	**10.03**	**8.83**	**8.18**	**8.21**	**7.30**	**7.92**	**7.20**

The several relationships may be interpreted to lead off in several new directions toward additional generalizations not attempted here, but all are consistent with the major point, that low values of n act to mute the effect of a/P on RRAT.

6. Table 6 shows that RRAT is remarkably insensitive to t when n and x are low-valued. This is on our assumption that s is independent of t. In the example, in fact, RRAT changes perversely with t, for values of n and x below 7. (I have set L=.2 to help bring out the last point). This effect testifies remarkably to the great importance of future sale values relative to current cash flow, when write-off is very fast.

Table 6: RRAT for different n and t, with L=.2 (x=n)

n \ t:	.2	.5	.8
5	10.19	11.46	12.72
6	10.20	10.62	11.05
7	10.21	10.03	9.85
8	10.21	9.58	8.95
18	10.14	7.78	5.41
28	10.05	7.24	4.33
50	9.91	6.76	3.56

How, one might ask, can there be a perverse effect of t on RRAT? It is because the assumption that F=P says the real estate does not depreciate. To write it off at all is therefore a freebie.

The freebie is inherent in the tradition, (internally inconsistent and illogical), that depreciation is recognized yearly, even if fictitious; but actual appreciation, even in the same property, is not recognized until the owner realizes it by sale, and receipt of cash from same. When the write-off is fast enough and the gains tax rate (s) low enough the freebie is worth more than the tax. The value of the freebie rises with t because s remains constant at .2.

7. Table 7 shows how RRAT varies with different values of L, at different values of n and x. This matter has been touched upon in Sections 2 and 4, but in other contexts. Here we are concerned with the effect of understating L.

RRAT is sensitive to L for low values of x. With low x and n the value to taxpayers of understating L rises very high. They are strongly motivated to misallocate basis from land to building, letting them depreciate land. This is an ancient loophole which perhaps crept in without arousing concern because with long tax lives for buildings it didn't make so much difference. With short tax lives it makes a large difference. With a low x one can write off land as some people are alleged to vote, "early and often".

Table 7: RRAT (%) for different L, n, and x

n	x	L: .0	.5	.9
5	5	12.91	9.34	6.65
5	50	6.15	6.08	6.02
50	5	9.73	7.55	6.27
50	50	6.95	6.47	6.09

When x=50, L hardly matters. When x=5, L does matter. And when both x and n=5, L matters a lot.

The approach taken here may understate the cumulative long term impact of land write-off. To deduct depreciation for land which is to last forever is to achieve tax exemption in perpetuity. All the treasury collects after that is a return on its own investment. To do this once every five or ten years is to secure a cumulative subsidy for holding land which, over time, constitutes a massive and continuing redistribution of national wealth.

D. Summary of findings

1. In the absence of resale there is only little effect of x on RRAT. Some writers have discounted the "double-dipping effect" of repeated depreciation of the same capital. The finding here is the reverse. Without early resale (or other inclusion of F in revenues) there is not much kick in fast write-off. F values are sustained by not just the future redepreciation of the capital, but depreciation of land.

2. The marginal effect of low x on RRAT is greater than the average effect, because no additional land is required, so L=0 in Eqn. (1). However even this marginal effect throws only little weight until it is coupled with fast write-off and turnaround.

3. Resale coupled with fast write-off gives a big boost to RRAT. The boost is weakened, but far from fully offset by the capital-gains tax. The "locking-in effect" of the latter is

generally weaker than the reverse "churning effect" of fast write-off coupled with redepreciation. "Locking-in" in the pure, partial sense usually perceived and expressed can and does occur where there is no depreciable base, i.e. with bare land and common stocks, for which L=1.

4. Resale effects make RRAT highly sensitive to F/P and to s. This is true of both the average and the marginal values of RRAT.

5. Ordinary cash flow recedes to being a secondary force determining RRAT, when n and x are low.

6. The tax rate (t) on ordinary income recedes even more, to a very weak influence on RRAT, when n and x and L are low. It is so weak that the effect becomes perverse at low enough values of n. This anomaly results from recognizing fictitious depreciation yearly while denying recognition to real appreciation until sale, and then at a lower effective tax rate.

7. Low values of x and n put a premium on understating L, which lets one write off land "early and often".

The bad effects of shortening tax lives in our present income tax system are many. The list below only hits the high spots.

A. Effective tax rates on capital in favored forms are reduced well below nominal rates, which are the real rates applied to salaries and wages and some kinds of capital earnings. Profound allocative and distributive biases result.

A great self-contradiction is internalized in the tax code in the asymmetrical treatment of depreciation and appreciation. Unrealized depreciation is recognized yearly, even when fictitious; while actual appreciation is not recognized until the owner realizes it by sale and receipt of cash, and then at a reduced real tax rate.

The cumulative effect of repeatedly depreciating the same land is first to reduce and then eliminate the tax. But then redepreciation continues indefinitely, an endless, ever-growing subsidy to holding land.

B. Much of the gain from fast write-off goes simply to raise land rents and prices. Land as a distributive share becomes a bigger mouth to feed without adding to service flow, for the rent-receiver as such takes without serving. When land price is higher the cash flow to real estate must be higher to avoid reducing the level of incentive and reward to investment in buildings.

C. Seekers after tax shelter bid land up and away from marginally qualified buyers, thus removing rungs from the ladder of upward mobility. A large class of potential owners become perpetual tenants. The economic wastes and losses inherent in absentee ownership and the landlord-tenant relationship are magnified. So are the social and political evils of dividing society into alienated classes.

D. Investments in longevity, with emphasis on enhancing resale value, are favored over investments with earlier payouts in ordinary cash flow. That bias may seem at first sight to be subtle and therefore shadowy and therefore negligible. But it results in a serious and damaging waste in a lower use of scarce national capital.

The favored use is lower not just in the obvious micro sense, but in an important macro sense such as that which moved Smith, Ricardo, Mill, Jevons, Wicksell, Bohm-Bawerk and Hayek to defend against policies with a bias toward retarding the great circulation of the national capital. Capital of deferred usefulness is not just diverted from its best use; it is frozen. That part of cash flow which consists of recovery of principal is deferred too, and all the reinvestment to be financed from cash flow -- which is most investment -- is deferred.

E. Focusing on the rental and resale markets distorts and degrades building design. Sterile, undifferentiated floor space standardized and homogenized for common denominators of taste and function is favored over quality, specialization, timeliness and individuality. Beauty? -- there is little room for romance in a building destined for a series of anonymous future owners and tenants. It is citified Gopher Prairie, safe and stultifying. The dull institutional style of ice-tray cubism seems a fitting symbol of tax-accountant architecture, where the designers evidently were told that form follows fast write-off and future windfall. Too much of today's private architecture is too much like public architecture which is too much like prison architecture.

F. The incentive to invest is destabilized when it becomes dominated by the vagaries of cycles in land prices. Harnessing unearned increments to serve as an incentive to build is not an achievement for which the world is better off.

First, such increments are chancy and fluctuant, and the expectation of them as much or moreso. F as part of the incentive to build is an anticipation of values and events several years ahead. The anticipation is highly unstable, subject to mass psychology and herd movements and the other elements of "irrational expectations" which dominate the real world.

Second, the existence of high land values, to which increments must lead, is highly depressing to the incentive to build. The obvious reason is that so much of the cash flow must now go to the landholder as such, leaving that much less to reward the builder as such. When values are falling, it is that much more depressing to incentives, as can be seen by setting $F/P<1$ in Eqn. 1, (and it is even worse than that because of limitations on deduction of capital losses).

But even rising values are less stimulating than would be stable values at a low level. Appendix 1 shows that the deadweight of land value incorporated in an investment lowers the rate of return unless the rate of increase on the land price alone exceeds that on the capital -- <u>in which case, however, the investor will prefer to hold the land vacant.</u> (This helps explain the otherwise anomalous juxtaposition of vacant land with intensive building in growth areas.)

G. Locational decisions are distorted. Investment is drawn artificially to neighborhoods and regions where land values are growing. Hibbard, Ely, Knight, Spahr and other ancient apologists for land speculation praised "the lure of unearned increment" for drawing investment into the frontier, which their expansionist ideology taught them was self-evidently a "good thing". Others like Harry G. Brown more correctly labelled this a locational distortion.

But it was and is worse than that. Because of interdependencies in regional and neighborhood expansion the lure is a Lorelei that leads whole regions through boom to crash on the rocks. Today the Lorelei of unearned increment draws capital from central city to suburb, and from rustbelt to sunbelt, so we have empty office space in Houston and Denver and capital starvation in Youngstown and The Monongahela Valley.

H. The huge service industries of finance and real estate are perverted in function. Economic theory explains to our eager young people that these white collars are usefully employed in creating "ownership utility", matching assets with the appropriate owners. But now the appropriate owner is the one whose bid is inflated by his ability to redepreciate capital, and depreciate land. This kind of churning serves no social good, but works ill by reinforcing and confirming the alienation between anonymous owners and tenants whom they know only by number and regard only as meal tickets.

The artificial churning is most stimulated where it is least socially useful, in the market for young and adolescent buildings. In the market for empty land an active, churning market would be a benefit. It would obviate the need for each firm to build up its own reserves of empty land for possible future expansion. But that is not where the churning is stimulated, because you cannot depreciate empty land, there has to be a building that can be confused with land.

It remains true that universal expensing of all new capital formation would achieve that part of the Georgist aim of untaxing capital while continuing to tax land, as Commons advocated. That would still leave the question of whether it is right to exempt capital while continuing to tax work, and I don't think that is even a question. But apart from that the present system perverts the Commons proposal beyond any acceptance. The shortening of lives is not enough by itself to raise RRAT substantially, but only in conjunction with fast turnaround, double-dipping, depreciating land, and exempting much of unearned increments from the income tax, all of which are odious.

APPENDIX 1: The depressing effect of land value on rate of return

Here we single out for inspection the sensitivity of RR to land value and its changes. We divide P (from Eqn. (1)) into building and site, B and S. Subscripts 0 and n indicate beginning and ending of investment periods. We multiply Eqn. (1) through by P; and set t and s at 0, for simplicity.

$$RR = \frac{a(1-I^{-n})}{(B_0 + S_0) - (B_n + S_n)I^{-n}} \qquad (2)$$

Now we collect the terms B and S in the denominator.

$$\text{Denominator} = (B_0 - B_n I^{-n}) + (S_0 - S_n I^{-n}) \qquad (3)$$

The presence of S_0 and S_n in the denominator raises it, and therefore lowers RR, unless:

$$(S_n / S_0) > I^n \qquad (4)$$

But (4) is only true if the rate of growth of S is greater than the RR. This is the circumstance in which the landholder would do better not to build at all, but buy more adjoining vacant land with the same high prospects. Be it understood here that S_n is not a hard fact but a subjective forecast, so that neighboring individuals will react differently to the same prospects. Such forecasting is one of the few refuges of individualism in a homogenized society, and unfortunately one where it does more harm than good.

The strength of the effect varies with the weight of S_0 vs. B_0 and of S_n vs. S_0. Table 8 shows specific values.

Table 8: RR for different S_0/B_0, and S_n/S_0 (t=0, s=0, n=15, a/B =.16)

S_0/B_0 \ S_n/S_0:	.5	1.0	1.5	2	8.0842	10
.0	14.95	14.95	14.95	14.95	14.95	14.95
.1	13.3	13.5	13.6	13.7	"	15.3
.3	10.8	11.2	11.6	11.9	"	15.7
.5	8.9	9.6	10.2	10.7	"	15.9
1.0	5.8	7.0	8.0	8.9	"	16.1
2.0	2.6	4.5	6.1	7.3	"	16.3

The RR on B_0 alone (with S_0=0) is 14.95%. The site factor lowers RR in all columns but the last two. In the penultimate column headed 8.0842 the site increment is neutral because it is at the same rate as that on the building, 14.95%. In the last column it raises the RR because the rate on the land alone is 16.59%, which is higher than the return on the building alone, or on any combination of land and building. This last is the case where the investor will prefer to hold land idle and buy more like it.