

Ec. 132, Wed. 29 Apr. 92

1. Reconstruct Eqn. ff. instrus. top p. 4.

a. Mult. top + botm by P (move bracket left of $\frac{F}{P}$)

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

b. Solve for P ($n=x$, so F is all G_n)

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

~~1. To remove "L" and "L-L", use~~

~~Divide P into $G + K$.~~

~~a) $G + K = \dots$~~

~~$$G_0 = -K + a(1-t) \frac{1-I^{-n}}{i} + t \frac{K}{x} \frac{1-I^{-x}}{i} + [F_n(1-s) + \frac{G_0}{x}Ls]I^{-n}$$~~

~~b. Collect G~~ ~~b) $\frac{F_n}{G_0} = G_0$, can collect G~~

~~$$G(1-sI^{-n}) = -K + a(1-t) \frac{1-I^{-n}}{i} + t \frac{K}{x} \frac{1-I^{-x}}{i} + F(1-s)I^{-n}$$~~

~~$G = PV$ ~~perpetuity~~ $\times$ Perpetuity Multiplier.~~

2. To remove the fraction, "L", ~~separately~~ ~~divide~~ P into G + K

$$a) \quad G + K = a(1-t) \frac{1-I^{-n}}{i} + t \frac{K}{x} \frac{1-I^{-n}}{i} + [F(1-s) + G_s] I^{-n}$$

$$b) \quad \text{Divide } F \text{ into } G + \Delta G; \quad \Delta G = F - G$$

(For simplicity, have set $n=x$, so K is fully depreciated. Even so, ΔG may include some resid. bldg. value)

$$\begin{aligned} [F(1-s) + G_s] &= F - s(F - G) = \cancel{G + \Delta G} - s \cancel{\Delta G} = G + \Delta G(1-s) \\ &= F - s \cdot \Delta G \\ &= G + \Delta G(1-s) \end{aligned}$$

c) Collect G

$$G = -K + a(1-t) \frac{1-I^{-n}}{i} + t \frac{K}{x} \frac{1-I^{-n}}{i} + [G + \Delta G(1-s)] I^{-n}$$

$$G(1 - I^{-n}) = -K + a(1-t) \frac{1-I^{-n}}{i} + t \frac{K}{x} \frac{1-I^{-n}}{i} + \Delta G(1-s) I^{-n}$$

$$\text{Thus, } G = C_1 \times \text{LVM (or Prop. Mult.)}$$

3. Importance of deprecn.

Collecting K on rt. side

~~$G_t = \text{gen. } \# / (\text{to disburse w. } (1-sI))$~~
 Rt. side now contains:

$$G_t = -K \left(1 - t \frac{1 - I^{-x}}{x} \right) = -K \theta (1 - t \theta)$$

a. If $x = \infty$, ~~no deduction~~, $\theta = 0$, $(1 - t \theta) = 1$.

Is worst case. a is taxed, K not deducted.
 Rt. side probly becomes negative.

b. If $x = 1$, ~~$\theta \rightarrow 1$~~ $\theta \rightarrow 1$

This is neutral, like expensing.

Lowers G to $G(1-t)$ (if $s=t$)

Exempts K from tax: taxes only G .
 $RRAT = RRBT$. Is feasible. (I favor it, myself.)

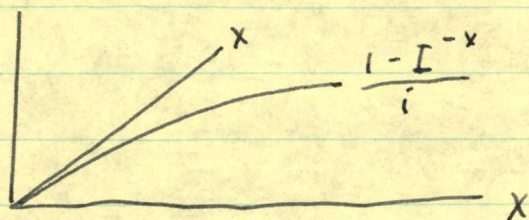
Tax reformers who talk about simplifying tax by allowing no deductions are talking dangerous nonsense. Would about all investment; tax + money as well as income.

3, PV of deprecn. (cont.)

PV of deprecn. depends on distinctive factor. θ

$$\theta = \frac{1 - I^{-x}}{ix} = \frac{1 - I^{-x}}{i} \cdot \frac{1}{x}$$

Goes up in fac. a lot: the PV/life ratio.
(same as disc. com/sim ratio).



x grows faster,
so ratio falls.

Values of θ ($i = .04$, real i.r.)

x	$i = \frac{.04}{.12}$	$.12$
1	.962	.893
4	.907	.759
8	.842	.621
16	.728	.436
32	.559	.253
64	.359	.130
128	.194	.065

Taxpayer wants highest θ . Can gain by lower x , esp. if go to extreme of $x = 1$. In fact, never got much below 18 for bldg, and now back up.

Found a better way, via early resale w. cap. gains.

4. Major findings.

a. Changing x , within usual limits, is a lesser factor, taken by itself. p. 10, T. 1

b. ^{p. 7, #4} Low values of x make RRAT very sensitive to:
~~p. 8~~

F/P	p. 12, T. 4A	(This means ΔG)
s	p. 12, T. 4B	
L	p. 11, T. 2B	

c. Factors affecting F are implicit. They are:

- 1) Residual bldg. value
- 2) Land value, re-use.
- 3) Tax shelter value.
- 4) Future incy.

See p. 8

d. With low x , effect of q/p on RRAT declines. It is swamped out.

Ordg. inc. of a bldg. becomes a 2dy factor.
p. 14, T. 5A

e. t itself becomes ~~a~~ less import factor.
p. 15, T. 6

This is partly an artifact of ass. that s is

independent of $\underline{t}$. Yet, that is what happened in 1986. $\underline{t}$ fell to .28, while $\underline{s}$ remained approx. the same.

Thus, no stimulus to bldg. from 1986 change.

f. RAAT sensitive to L.

2 dry ~~#~~ mkt. deflating L is routine, & massive. This raises F in C₁.

2nd p. 16, T. 7. Double RAAT by lowering L from .9 to .0