

AMERICAN INSTITUTE FOR ECONOMIC RESEARCH

GREAT BARRINGTON, MASSACHUSETTS 01230

August 19, 1993

Dr. Robert A. Gilmour
President

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To: Participants in Tax Policy and Capital Formation Seminar
From: Bob Gilmour

Welcome! Room assignments for those staying over are listed below. The AIER Floor Plan on the table in the entry hall will assist you in finding your room.

<u>Name</u>	<u>Room #</u>
Rexford Ahene	E7, 3rd floor
Carl Case	E4, 2nd floor
Tom Downs	E8, 3rd floor
Fred Foldvary	E1, 2nd floor
Mason Gaffney	G3, 2nd floor
Drew Harris	E2, 2nd floor
Jerome Heavy	E3, 2nd floor
Peggy Musgrave	A2, 2nd floor
Richard Musgrave	A2, 2nd floor
Richard Noyes	E6, 3rd floor
Nic Tideman	E5, 2nd floor
William Peirce	G2, 2nd floor
William Vickrey	G4, 2nd floor

A light supper (chef's salad, rolls, fruit) will be available Thursday evening at 6 p.m. in the Dining Room for those arriving in time.

Friday and Saturday meal schedules are as follows:

Breakfast: 7:00 a.m. - 8:30 a.m.
Lunch: 12:30 p.m. - 1:00 p.m.
Dinner: 6:00 p.m.

The Seminar will convene at 8:45 a.m., Friday, in the Helen F. Harwood Ballroom. Professor Gaffney will then describe the rest of the grueling schedule he has set.

SPEAKERS, Seminar on Tax Policy and Capital Formation
AIER, Gt. Barrington, August 20-21, 1993

Rexford Ahene g
Lafayette College, Easton PA 18042; 215/250-5302

Tom Downs, 256 Alston Hall, Univ. of Ala., Tuscaloosa AL 35487
205/348-4590 off; 345-5202 res.

Asset value effect of lowering effective tax rate on new investing.

Fred Foldvary, knows Austrian capital theory and literature
132 Roberts Lane, #301, Alexandria VA 22314; 703/683-7769;
FAX % Janet Schweiss, 202-944-7266; UNTIL TUESDAY, 510/843-0248

We should rule out policies that may foster capital accumulation at the expense of efficient allocation. This idea goes back at least to Ricardo, and is central to the older Austrian economics. Perhaps Fred will drive home the point.

Mason Gaffney

Jerome Heavey 1 g
Ecs., Lafayette College, Easton PA 18042 Allen Fdtn.
215/250-5306; or 5300.

George Gilder. AIER trustee. Best-selling writer, speaker. See Am. Spectator, July, "Wealth and Poverty Revisited." PN12-AG

Richard Musgrave (J. of Economic Perspectives I(1), summer 1987, p.69). 408/425-7171, Sta Cruz res. 408/459-2743 off?; In Vermont, Forge Cottage, POB 98, Hartland-4-corners, 05049, phone 802/436-3057.

Peggy Musgrave (tentative); International comparisons of tax systems; International capital flows.

Nic Tideman. Dep/Ecs, VPI & SU, Blacksburg VA 24061; 435 Big Sky Trail, Blacksburg 24060; 703/231-7592 off; 951-2398 res; 231-5097 FAX

William Peirce

Technology and capital formation; elasticity of capital supply. Box 154, Gates Mills OH 44040; Dep/ecs, Case Western Reserve Univ., Cleveland, OH 44106; 216/368-4131 off; 216/442-1921 res. Bill is the original link with AIER; he is on their Board. Has written a good editorial for lvt. Link with Cleveland's William Bier, advisor to Mayor.

Larry Pratt, AIER.

William Vickrey, 162 Warburton, Hastings-on-Hudson NY 10706
914/478-0577 res

Annotated

TAX POLICY AND ASSET VALUES

Thomas W. Downs University of Alabama

AIER Seminar on Tax Policy and Capital Formation, Great Barrington MA
August 1993

Discussion Outline

1. The valuation framework
 - *refer to "Q and the tax bias theory"*
2. Estimation of valuation biases
 - *biases due to the discounting effect*
 - *biases due to tax effects*
3. Evidence supporting the bias estimates
4. Implications for tax policy and capital formation

Financial accounting approaches to asset valuation

- *Historical cost (HC) approach* -- multiply the original cost by the proportion of remaining productive capacity
- *Current cost (CC) approach* -- adjust HC for inflationary changes in the supply price of capital

② DCF lacks an equilibrium setting

how assets are valued in practice

Slide 2

THE CURRENT PERCEPTION

"Since old capital and new capital are perfect substitutes in production, their net acquisition costs must be identical in equilibrium."

Auerbach & Kotlikoff,

The Economic Consequences of Government Deficits, 1983

"If markets existed for all the firm's assets, the value of the firm reported on the balance sheet under current cost accounting would equal the market value of the firm's securities..."

Research, 1988

Haw and Lustgarten, *Journal of Accounting*

Fundamental economic value: a 2-stage process

1. the marginal investment equilibrium

determines $\partial Q / \partial K$:

$$q_s = vq_s + \sum_{t=1}^{\infty} (1+r-\pi)^{-t} \frac{\partial Q}{\partial K} \left[1 - \sum_{j=1}^t d_{j-1} \right] (1-\tau) + \tau \sum_{t=1}^{\infty} (1+r)^{-t} z_{s,t}$$

where q =supply price r = interest rate

π = inflation rate v = ITC τ = tax rate

d_j and $z_{s,t}$ = capacity and tax depreciation

$$\frac{\partial Q}{\partial K} = \frac{q(r-\pi)(1-v-\tau Z)}{(1-\tau)(1-D)} \equiv \text{the rental price}$$

stage 1 of the valuation process

Slide 4

1) Idea is not new.
Aik, Feldstein 1976

DCF analysis into an equilibrium - constant valuation process. Idea is not new

about substitution of ~~cost~~ marginal into total.

2) see Hall 1987

3) talk NOW

Slide 4

"In the first year of its use the owner realises the "current service." Naturally, this service, thus consumed or rendered, comes off the value of the machine (which we may call the "bearer of the use"), and the good suffers a loss of value."

Capital, 1888

Eugen Bohm von Bawerk, *The Positive Theory of*

"Let us call this quantity which measures the sacrifice of value involved in the production of A the user cost of A. ... User cost has, I think, an importance for the classical theory of value which has been overlooked. .. User cost constitutes one of the links between the present and the future."

Keynes, *The General Theory*, 1936.

2. use $\partial Q / \partial K$ for valuing the accumulated capital stock

the way you did it for the first time, we did not do it this way

$$FV_s = \sum_{t=1}^{\infty} (1+r-\pi)^{-t} \frac{\partial Q}{\partial K} K_{s,t} (1-\tau) + \tau \sum_{t=1}^{\infty} (1+r)^{-t} (f(z_{s,t}))$$

(7)

substitute the expression for $\partial Q / \partial K$ and :

(11)

$$FV = q_s K_s ((1-v-\tau Z)(1-H) / (1-D) + \tau Y)$$

or

$$FV = CC_s ((1-v-\tau Z)(1-H) / (1-D) + \tau Y)$$

Fundamental economic value equals current cost times an adjustment factor

Two sources of bias in CC

The discounting effect (let $\tau=v=0$):

$$FV_s = CC_s (1-H)/(1-D)$$

- ① go of
the average
period
marginal
Give 1 // variation wrt ~~CC~~
- ② talk about light bulb

$$\frac{dV}{dr} \geq 0$$

The tax effect (let $H=D$):

- ③ ~~2~~ incremental information set

$$FV_s = CC_s (1-v-\tau Z)(1-H)/(1-D) + \tau Y$$

Nonfinancial Corporate P&E

$(1-H)/(1-D)$

$1-v-\tau(Z-Y)$

① Explain term
each w/ CC

1958 .79

.96

1959 .79

.97

1960 .80

.97

1961 .80

.98

1962 .80

.96

1963 .80

.96

1964 .80

.96

② Remember
these affects
one another

additive not
multiplicative

3

Remember
this is the
same answer
you get a

specify why it's
equilibrium
cost of
streams and
discounting

$(1-H)/(1-D)$ measures the discounting bias

$1-v-\tau(Z-Y)$ measures the tax bias

Ostle *Decision*

BIAS:	discount	tax	discount	tax
1965	.81	.96	1974 .74	.90
1966	.80	.96	1975 .75	.87
1967	.80	.95	1976 .77	.86
1968	.79	.94	1977 .76	.86
1969	.79	.96	1978 .68	.86
1970	.79	.96	1979 .74	.86
1971	.78	.93	1980 .76	.88
1972	.77	.92	1981 .75	.80
1973	.77	.92	1982 .79	.81

	discounting bias	tax bias
1982	.79	.81
1983	.79	.82
1984	.78	.82
1985	.78	.84

Why did the tax bias become severe?
remember a value of unity implies neutrality and in 1958

1958	.79	.96
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C) Explain

many accumulated assets are depreciated by straight line

$$1 - v - \tau(Z - Y)$$

Z

Y

1958

.57

.50

.96

1965

.56

.52

.96

1970

.52

.45

.96

1975

.55

.38

.87

1980

.50

.33

.88

1981

.63

.33

.80

1985

.61

.39

.84

ACRS

ACRS

Z and Y are PV of tax depreciation per

dollar of new and used assets; v is ITC, τ

is corporate tax rate

actually total Assets

Table 5
Cross-sectional regression results, 10 industries.

Year	Unadjusted $Q_t = \alpha + \beta$ (intrinsic Q) _t				
	α	(t-stat)	β	(t-stat)	R^2
1968	1.80	(0.30)	-0.42	(-0.06)	0.00
1969	-2.31	(-0.31)	3.54	(0.45)	0.02
1970	-2.24	(-0.31)	3.37	(0.46)	0.03
1971	-2.07	(-0.38)	3.35	(0.58)	0.04
1972	-1.33	(-0.28)	2.58	(0.50)	0.03
1973	-0.96	(-0.27)	1.94	(0.50)	0.03
1974	-1.68	(-0.50)	2.59	(0.69)	0.06
1975	-1.53	(-0.58)	2.62	(0.85)	0.08
1976	-1.48	(-0.68)	2.61	(1.01)	0.11
1977	-3.64	(-1.62)	5.10	(1.92) ^a	0.31
1978	-4.05	(-1.75)	5.54	(2.02) ^a	0.34
1979	-3.16	(-1.57)	4.43	(1.87) ^a	0.30
1980	-4.22	(-1.82)	5.56	(2.10) ^a	0.35
1981	-3.15	(-2.39) ^b	4.71	(2.83) ^b	0.50
1982	-1.91	(-1.11)	3.23	(1.49)	0.22
1983	-2.14	(-1.21)	3.60	(1.63)	0.25
1984	-2.74	(-1.49)	4.16	(1.85) ^a	0.30
1985	-1.74	(-0.92)	3.01	(1.31)	0.18

^aSignificant at the 10 percent level.

^bSignificant at the 5 percent level.

Notes: Unadjusted Q equals the ratios of industry market value to current replacement cost and is taken from the R&D MasterFile [Hall et al. (1988)].

Intrinsic Q is computed from eq. (12) as $1 - v - \tau(Z - Y)$ and it represents the theoretical ratio of tax-adjusted fundamental value to current replacement cost.

T -statistics are shown in parentheses.

TABLE 3: Regression results from the estimation of equation 3

$$\log MV_t = \alpha_0 + \alpha_1 \log CC_t + \alpha_2 \log B_t + \varepsilon_t$$

row 1: α_0 , α_1 , and α_2 are allowed to vary across industries; $R^2=0.9710$

$$\text{SIC 481: } \log MV_t = 0.48 + 0.97 \log CC_t + 1.46 \log B_t$$

(0.4) (7.5) (1.2)

$$\text{SIC 491: } \log MV_t = 1.39 + 0.93 \log CC_t + 2.97 \log B_t$$

(1.1) (7.2) (3.3)

$$\text{SIC 492: } \log MV_t = -.86 + 1.13 \log CC_t + 2.63 \log B_t$$

(-.4) (5.3) (3.2)

row 2: α_2 is restricted across industries; $R^2=0.9716$

$$\text{SIC 481: } \log MV_t = -.44 + 1.08 \log CC_t + 2.52 \log B_t$$

(-.6) (15.5) (4.7)

$$\text{SIC 491: } \log MV_t = 1.96 + 0.87 \log CC_t + 2.52 \log B_t$$

(2.3) (10.3) (4.7)

$$\text{SIC 492: } \log MV_t = -.61 + 1.10 \log CC_t + 2.52 \log B_t$$

(-.4) (7.5) (4.7)

row 3: α_1 and α_2 are restricted across industries; $R^2=0.9647$

For all industries:

$$\log MV_t = \alpha_0 + 0.98 \log CC_t + 2.35 \log B_t$$

(14.4) (5.5)

where $\alpha_0 =$

0.70	(1.0)	for SIC 481
0.64	(0.9)	for SIC 491
0.69	(1.2)	for SIC 492

row 4: α_0 , α_1 , and α_2 are restricted across industries; $R^2=0.9648$

For all industries:

$$\log MV_t = 0.78 + 0.97 \log CC_t + 2.32 \log B_t$$

(2.9) (37.3) (10.6)

Notes:

For each row the industry data are stacked and one ordinary least squares equation is estimated. Dummy variables are used, as appropriate, to allow estimated slope or intercept coefficients to vary between industries. Each equation is estimated with annual observations over the 1968-1985 sample period.

SIC 481 is Telephone Communications.

SIC 491 is Electric Services.

SIC 492 is Natural Gas Transmission and Distribution.

MV is the market value of the industry's financial liabilities.

CC is the current cost of the industry's assets.

B is the hypothetical bias embedded within the CC valuation estimates.

T-statistics testing for equality with zero are in parentheses. Critical values are approximately 1.68, 2.01, and 2.70 at the ten, five, and one percent significance levels, respectively.

R^2 is the corrected R-squared.

Downs, T.W., "The Association Between Security Market Values and Tax-Adjusted Fundamental Values for Public Utility Property," unpublished manuscript.

TABLE 3

Comparison of Point Estimates from the Alternative Valuation Models with Observed Asset Prices (Land [1974; 1977; 1981]) from Active Secondary Markets

	Retention of Value Ratios for a Six-Year-Old Asset in:		
	1973	1976	1980
Observed prices:			
Mean used price ratios for the sample of 4,875 standard specifications of industrial machinery and equipment (see Shriver [1987])	.33	.32	.34
99% confidence interval	.32-.34	.31-.33	.33-.35
Point estimates assuming double-declining balance capacity depreciation:			
Historical Cost (HC)	.30	.24	.22
Current Cost (CC)	.37	.37	.37
Fundamental Value (FV)	.30	.27	.26
Point estimates assuming straight-line capacity depreciation:			
Historical Cost (HC)	.43	.35	.32
Current Cost (CC)	.54	.54	.54
Fundamental Value (FV)	.31	.28	.27
Point estimates assuming decelerated capacity depreciation:			
Historical Cost (HC)	.66	.54	.49
Current Cost (CC)	.82	.82	.82
Fundamental Value (FV)	.39	.36	.32

Both the point estimates and the observed prices (Land [1974; 1977; 1981]) are formulated as the ratio of "six-year-old used asset price + current specific price of a new asset." All of the point estimate retention of value ratios are significantly different from the market price retention of value ratios at the 0.01 significance level, based on a two-tailed large sample test for a population mean.

Cumulative Excess Returns (CARs) for Alternative Analyses
(*t*-Statistics in Parentheses)

	20	22	26	28	Industry SIC Code			30	32	33	35	36
					Economic Recovery Tax Act of 1981							
1) PCAR, predicted cumulative excess return	1.82	1.07	.50	3.05	.18			-.15	-.90	-1.05	3.50	3.87
2) CARs for full sample of firms	2.17*	-2.60	.20	-.02	9.98**			-1.47	.71	.31	-1.37	-1.17
	(1.76)	(-1.09)	(.11)	(-.02)	(2.15)			(-.74)	(.38)	(.20)	(-1.08)	(-.84)
3) CARs for one-day windows	1.52*	-.67	.28	-.51	3.71			-1.92	.72	.28	-.64	-.23
	(1.82)	(-.41)	(.23)	(-.70)	(1.16)			(-1.43)	(.58)	(.27)	(-.74)	(-.25)
4) CARs with firms dropped due to confounding news	1.42	-2.60	.32	-.05	10.07**			-2.01	.67	.14	-1.30	-1.56
	(1.17)	(-1.08)	(.17)	(-.04)	(2.25)			(-.94)	(.34)	(.09)	(-1.00)	(-1.06)
5) CARs with firms dropped that have daily returns that are 3 percentage points greater or less than the market	2.18*	-3.46	-.69	.45	10.31**			-1.41	1.39	.25	-1.51	-1.48
	(1.86)	(-1.50)	(-.39)	(.42)	(2.36)			(-.66)	(.95)	(.15)	(-1.17)	(-1.05)
					Tax Reform Act of 1986							
6) PCAR, predicted cumulative excess return	-7.52	-3.27	.77	-6.67	4.79			-3.03	-4.34	.58	-7.29	-9.60
7) CARs for full sample of firms	1.65	.83	-2.39	1.09	1.45			.55	-2.64	-2.93	-1.42	-.48
	(1.05)	(.35)	(-1.26)	(.90)	(.46)			(.22)	(-1.43)	(-1.53)	(-1.11)	(-.38)
8) CARs for one-day windows	1.61	.88	-1.29	1.42*	1.48			1.15	-.53	-1.87	-.19	-.34
	(1.47)	(.55)	(-.97)	(1.68)	(.67)			(.66)	(-.41)	(-1.40)	(-.13)	(-.40)
9) CARs with firms dropped that have daily returns that are 3 percentage points greater or less than the market	1.66	.46	-1.62	1.05	1.58			2.44	-2.96	-3.09	-1.47	-.04
	(1.07)	(.19)	(-.90)	(.82)	(.53)			(1.17)	(-1.51)	(-1.51)	(-1.11)	(-.03)

* Significant at the 10 percent level.

* Significant at the 5 percent level.

Downs, T.W. and C. Demirgüç, "The Asset Price Theory of Shareholder Revaluations: Tests with the Tax Reforms of the 1980s," *The Financial Review*, 27(1992): 151-184.

Implications for capital formation

① The "effective tax rate" concept of Jorgenson (1981) and Hall (1981) is a measure of the difference between the IRR of the pre-tax and after-tax cash flow streams.

↑ Allan Quasha tries to justify this position on IRR

An alternative and perhaps superior approach measures the value of the asset stock with and without tax effects. (See Alchian (AER 1955))

These ratios measure:

value of NFC P&E without taxes

÷

value of NFC P&E with taxes

1958	1.037	1964	1.029
1959	1.041	1965	1.018
1960	1.041	1966	1.017
1961	1.048	1967	1.014
1962	1.035	1968	1.001
1963	1.034	1969	1.028

value of NFC P&E without taxes

÷

value of NFC P&E with taxes

1969	1.028	1976	.916	1983	.862
1970	1.022	1977	.916	1984	.872
1971	.993	1978	.919	1985	.888
1972	.980	1979	.918		
1973	.980	1980	.932		
1974	.972	1981	.854		
1975	.924	1982	.853		

Other ????

(2)

Comparative statics

$$\frac{\partial V}{\partial \tau} = -\left(2\left(\frac{1-H}{1-D}\right) + Y\right) \frac{1-H}{1-D}$$

(3)

Broden definition measurement of capital

FOCUS on targets with targets as well

these can yield insight on incidence

Slide 18