

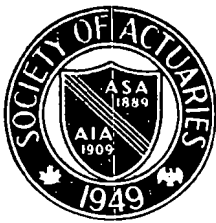


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TAXES AND PROFIT DISCOUNTING

by Douglas A. Eckley

The question can be put simply: should statutory profits be discounted at an after-tax rate, or at a pre-tax rate? Beyond the pedantic answer, "yes", there are some hair-raising complications.

Imagine that statutory profits have been projected for each of the next thirty years. This may have been done for a block of in-force, a company, or per-thousand-of-face-amount for a new product. Now the profit stream is to be discounted to a present value.

Why After-Tax?

One strong argument for using an after-tax rate takes the "reductio ad absurdum" form. If profits were being accumulated, rather than discounted, an after-tax rate would be used, because tax would have to be paid on the investment income generated as the company reinvested the profits. Assume for the sake of argument that the profit stream is negative in the first year, positive thereafter, and non-decreasing. Further, assume that the accumulation at the after-tax rate is zero after ten years. If the same ten years of profits are discounted at the higher pre-tax rate, then the present value will be negative. The absurdity is that the stream breaks even, yet has negative value. The conclusion—profits must be discounted at the after-tax rate.

Why Pre-Tax?

But there's a strong argument for the opposite view which also takes the "reductio ad absurdum" form. Compare two products, similar in every respect except that one has lower reserve requirements than the other in every year until the last (when reserves naturally become zero). The low-reserve product should produce an equal or higher present value of profits because of earlier availability of profits. (Higher reserves defer taxes also, but

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TO PROSPECTIVE ENROLLED ACTUARIES

If you are unhappy that the transitional period, within which credit will be granted for the first part of exam EA-1, extends only through 1985, please write to the Joint Board for Enrollment of Actuaries, 1725 Eye Street, Suite 1103, Washington, DC 20006. It may not be too late to persuade the Joint Board to lengthen this, if enough of us show that we are interested.

Ed. Note: This notice is displayed at the request of a displeased student who found out for himself that the Joint Board IS INTERESTED in hearing views on appropriateness of their announced transition rule.

MORE ON GAAP FOR MUTUALS

by Donald D. Cody

Daniel F. Case's article (Dec. 1983 issue) prompts me to discuss how statutory financials would differ from a reasonable GAAP for Mutuals structure, if the latter were ever imposed. Background may be found in my paper, TSA XXXIII (1981) 313-366, "An Expanded Financial Structure for Ordinary Dividends", in Thomas G. Kabele's brilliant discussion of it, and in my subsequent TSA XXXV (1983) preprinted September 2, 1983 "The Generalized Ordinary Dividend Formula Under TEFRA".

The generalized dividend formula explicitly contains all factors of the mutual company financial mechanism; all Contribution Principle formulas are approximations of it. It is practicable, and in use in at least one company. It provides an exact answer to the GAAP-for-Mutuals question, if indeed there should be such a question.

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A FAIRY TALE

by David H. Raymond

Once upon a time there were two persons, identical except for one minor difference—Fanatica Feminista was female; Machismo Maximo was male.

Fanny and Macho took identical jobs at World Wide Widget Works on the same day. Each contributed 3% of salary to WWW's thrift plan, which accumulated to \$100,000: \$20,000 of contributions and \$80,000 of investment income. Reaching age 65, each had two options:

To take the \$100,000 in cash, or

To take a life annuity worth \$100,000 from Actuarially Equitable Annuity Company.

Actuarially Equitable, using the 1983 Individual Annuity Mortality Tables which showed Fanny's life expectancy to be 21% greater than Macho's, offered Fanny \$907.45 per month and Macho \$986.38 per month, 9% more—these weren't 21% different because of the impact of interest, at 9% p.a. on the calculations. After taxes at 20% these annuities would yield \$744.29 monthly to Fanny, \$811.40 to Macho.

Fanny was unhappy. She was glad to have 21% greater life expectancy than Macho, but was unwilling to acknowledge the implication for her annuity benefit. She demanded that Big Brother do something about her unhappiness. Big Brother, whose preference for political over actuarial considerations had already been demonstrated by the condition of his social security system, told WWW that if annuities were offered they must provide identical monthly payments.

WWW, not prepared to pay an extra 9% for all its female employees, and fearing that if it did, Macho would

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ELAPSED EXAMINATION TIMES

by *Marta L. Holmberg, Examination Staff Consultant*

This is a tabulation, for all our new Fellows who qualified in the May and November 1983 examinations, of the years that elapsed from the date when each wrote his or her first examination.

STUDY OF ELAPSED TIMES BY ALL (211) 1983 NEW FELLOWS

Years	From First Exam Written to A.S.A.		From A.S.A. to F.S.A.		From First Exam Written to F.S.A.	
	N	Cumulative Frequency	N	Cumulative Frequency	N	Cumulative Frequency
Less than 2	8	3.8%	7	3.3%	0	0 %
2.0	19	12.8	7	6.6	0	0
2.5	17	20.9	13	12.8	1	0.5
3.0	36	37.9	36	29.9	1	0.9
3.5	33	56.4	32	45.0	1	1.4
4.0	32	68.7	46	66.8	1	1.9
4.5	14	75.4	6	69.7	3	3.3
5.0	12	81.0	17	77.7	12	9.0
5.5	11	86.3	6	80.6	14	15.6
6.0	7	89.6	7	83.9	21	25.6
6.5	5	91.9	8	87.7	18	34.1
7.0	4	93.8	5	90.0	22	44.5
7.5	4	95.7	6	92.9	13	50.7
8.0	1	96.2	3	94.3	17	58.8
8.5	2	97.1	2	95.3	14	65.4
9.0	1	97.6	2	96.2	8	69.2
9.5	2	98.6	1	96.7	10	73.9
10.0	3	100.0	3	98.1	9	78.2
10.5		100.0	1	98.6	13	84.4
More than 10.5		100.0	3	100.0	33*	100.0
	<u>211</u>		<u>211</u>		<u>211</u>	
Median, yrs.	3.5		4.0		7.5	
Mean, yrs.	3.96		4.38		8.27	

*Elapsed times for these 33 persons were: 11.0 or 11.5 yrs., 9; 12.0 or 12.5, 5; 13.0 or 13.5, 8; 14.0 or 14.5, 5; 15 yrs. or more, 6. The longest elapsed time was 20.0 yrs. (1 person).

In interpreting this, one must keep in mind that the candidates whose elapsed times were relatively long don't represent a homogeneous population; not all of them had trouble with one or more exams, rather some ceased for various reasons and for various periods to sit for examinations. Note also that the clusterings of candidates around the medians and means in the two partial segments differ substantially from each other. The diversity, perhaps naturally, is greater in the "A.S.A. to F.S.A." segment when mathematical skills become less critical to success. □

HE THAT RUNS MAY READ

We gladly draw attention to the first issue of a highly specialized journal, ACTUARIAL MARATHONERS NEWSLETTER. For a copy, write to Michael J. Cowell at his Yearbook address.

Its title page depicts a crowd running along a q_x-curve, but only through its nearly level segment, to age 35 or so. After that the runners seem to establish a mortality curve of their own, rising, apparently, to no more than one per thousand at age 70.

The editorial message asserts that close to one person in 200 among North America's adult population has run a full marathon course, an extraordinarily large number of these being actuaries.

This is followed by speculation on what makes actuaries such dedicated runners.

Appended is a Directory listing the names and records of more than 40 actuarial marathoners of whom the editor has personal knowledge, and a form, by completion of which others may join that list in future issues.

E.J.M.

Taxes and Profit Discounting

(Continued from page 1)

taxes are less than profits.) This will happen only when the discount rate equals or exceeds the assumed earnings rate. The after-tax rate will usually be less than the assumed earnings rate, causing the absurdity of higher reserves, yet

STOCK MARKET VALUES, 1871-1983 ("S & P 500")

For the convenience of readers who may want to trace the peregrinations of an accepted index of U.S. stock market prices (with allowance for dividends paid) for any considerable part of the past 113 years, we have again prevailed upon Mr. Herbert W. Hickman to give us the extension of his table printed in TASA XXII (1970), 197. The complete extension, including values we previously published, follows.

Year	Average Value	December Value
1969	1,601.87472	1,515.62979
1970	1,415.12817	1,556.59853
1971	1,717.15898	1,757.34050
1972	1,954.79661	2,128.67577
1973	1,975.88887	1,770.96944
1974	1,593.23823	1,323.39147
1975	1,722.84816	1,808.61154
1976	2,105.07925	2,196.79755
1977	2,109.49992	2,061.48770
1978	2,161.81552	2,218.19567
1979	2,429.96712	2,605.89674
1980	2,926.26361	3,368.67049
1981	3,300.35715	3,279.03126
1982	3,258.80565	3,892.65850
1983	4,524.94941	4,740.06634

In our next issue we will show what these figures tell about growth in common stock values, and its relation to growth in the Consumer Price Index in the United States.

E.J.M.

higher profits. The conclusion—profits must be discounted at the pre-tax rate.

Can This Paradox Be Resolved?

One possibility is that there is no right answer. Different discount rates may be appropriate in different circumstances. Perhaps the most valid use of a discount rate with a new product is to determine an equivalent level profit; then any reasonable rate might suffice with proper disclosure. In valuing a company, the selection of discount rate might reflect the investor's intention; an after-tax rate would be used if profits were to be left in the company, and a pre-tax rate if they were to be withdrawn as earned (thus taxed to the investor). Disclosure in this case is of paramount importance. □