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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 WWWW'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 WWWW that if annuities were offered they must provide identical monthly payments.

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

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EDITORIAL

YEARS OF PURGATORY

Marta L. Holmberg, elsewhere in this issue, gives us a helpful look at the distribution of times taken by the welcome 211 who achieved Society Fellowship last year. This displays an important measure of the soundness of our qualification system; we look forward to more such analyses that Dr. Holmberg has promised.

Impressive indeed are the records of the seven Fellows who arrived in less than five years—and, in a different way, of the six who persevered (not, as Dr. Holmberg reminds us, necessarily continuously) for fifteen years or more. Particulars of the student careers of those at the extremes of the distribution would be enlightening, as are the averages to which we confine our observations here.

What about our 7½-year median and our 8.27-year mean qualification periods? To begin with, we know these are longer than those of the Institute of Actuaries; William W. Truckle's paper reviewed in our April 1982 issue says:

> "The time taken to qualify is generally rather long. Members currently completing the Institute's examinations will have taken on average 6½ years . . ."

But, how do our present averages compare with performances of our own former days? This matter seems not to have been covered in the *Transactions* as often or as thoroughly as its importance warrants, but there are some comparative facts.

James R. Herman—T.A.S.A. 50 (1949), 64—gave some averages, probably means, going back to new Fellows of 1920, as follows:

1920-24	6.7 years
1925-29	6.7
1930-34	7.2
1935-39	8.6

and he showed the painful increase in this figure to 13.6 years in the World War II years when military service took priority in so many cases.

Harry M. Sarason—T.S.A. 1 (1949), 99—felt able to say of the post-war era that "A median of 6 or 7 years to become a Fellow is very comforting". We note in passing that Charles A. Spoerl in the same volume, p. 59, said:

> "A comprehensive record system has been started by means of which we will be able to follow individual students or groups of students from their first registration through the entire series of examinations. . . . we have organized a special section of the (E. & E.) Committee to be in charge of all statistical studies."

We wonder if Society archives contain the results of that special section's findings that were not previously given to members outside the E. & E. heirarchy.

In informal discussion on selection, education and training of actuarial students a few years later—T.S.A. 7 (1955), 291—Robert G. Espie observed:

> "During the past ten years the Examination Committee has reduced the total number of references on the syllabus from 201 to 132. The list of books, journals and miscellaneous recommended publications now totals 29 rather than 61 as in the 1945 course of reading. These reductions in many cases have been made possible by the preparation of more comprehensive sets of study notes . . ."

All of these references belong to eras before the responsibilities of qualified actuaries and the economically and socially induced complications impinged so heavily upon our educational needs as they have in the past two decades. All of which is to say that it is good for us to take a fresh look at qualification times.

E.J.M.

ANY QUERIES ON E. & E.?

The formerly popular *E. & E. Corner* has been in limbo recently because no questions have come in. Please be assured that enquiries are welcomed. Send them to E. & E. General Chairman James J. Murphy at his Yearbook address.

A Fairy Tale

(Continued from page 1)

complain to Big Brother that he was a victim of illegal discrimination because his annuity would then be worth less, removed the annuity option from its thrift plan.

A Trip For Fanny

Fanny triumphantly took her $100,000 and headed for Politically Expedient Annuity Company, which advertised "unisex" rates. A funny thing happened to her on the way. An IRS agent accosted her and explained that since she had constructively received the money she couldn't spread the tax on the $80,000 investment income over the rest of her life interest-free. She had to pay now; getting so much in one year boosted her average tax rate from 20% to 30%. The IRS took $24,000.

Fanny wondered if she should feel betrayed because Big Brother, who had helped her to reach this state of affairs, now had $24,000 of her savings. She decided that everything must be OK—she had forced Macho to give Big Brother $24,000 also.

But another funny thing happened when Fanny reached Politically Expedient; that company's agent told her she'd have to pay a 5% sales charge, which wouldn't have happened if she'd stayed in the thrift plan. So the company took $3,800, leaving $72,200, which bought $655.18 per month ($593.72 after taxes). Fanny noticed immediately that $655.18 is to $72,200 as $907.45 is to $100,000:

> "You're using the same rates as Actuarially Equitable's female rates," she cried. "You advertised unisex rates. You're supposed to charge Macho more and me less."

The agent explained,

> "These *are* unisex rates. We charge them to all our annuitants, regardless of sex. They happen to be female rates because all our annuitants are women. A man would be a fool not to buy from a Canadian company at a fair price." □