1-1-1997

The Distributional Effects Of Using A Before-Tax Standard: A Comment

Brian C. Brush
Marquette University, brian.brush@marquette.edu

Published version. *Journal of Forensic Economics*, Vol. 10, No. 1 (Winter 1997): 65-68. DOI.

Journal of Forensic Economics 10(1), 1997, pp. 65—68

The Distributional Effects Of Using A Before-Tax Standard: A Comment

Brian C. Brush*

The papers in a special section in the Fall 1994 issue of this journal titled "Taxes and Economic Awards" presented several different approaches to the problem of accounting for income taxes in the calculation of economic damage awards. Of particular interest was the excellent paper by Harris (1994), who compared before-tax and after-tax damage awards using a model which incorporated progressive federal and state income tax schedules into the calculations. He presented results showing the impact of variations in worklife expectancy, income level, the spread between earnings growth and discount rates, the absolute level of earnings growth and discount rates, and marital status on the overcompensation or undercompensation which would result from ignoring tax considerations in the calculation of awards. The purpose of this comment is to suggest simple improvements in Harris' model which provide for greater accuracy and flexibility while also making explicit the role of a key variable, the rate of inflation. The impact of the improvements on the calculation of after-tax damage awards is illustrated.

For various sets of assumptions about worklife, income, earnings growth rates, discount rates and marital status, Harris applied progressive taxation to both wage earnings and the interest earned on the lump sum award to calculate after-tax awards, and then compared these results to before-tax awards based on the same sets of assumptions. However, while in each case he calculated the taxes due on interest for each year of the worklife, he calculated the taxes due on wage earnings just once, on the base year earnings. He then made the simplifying assumption of a constant rate of growth in *after-tax* earnings over the remainder of the worklife. Thus, Harris compared a before-tax award based on a given before-tax earnings growth rate (e.g., 5%) with an after-tax award based on the same growth rate (e.g., 5%) applied to *after-tax* earnings. But with progressive taxation, the after-tax growth rate will normally differ from the before-tax growth rate. In the absence of any other simplifying assumptions, such a comparison of before-tax and after-tax awards would be distorted because the two awards would be based on different *before-tax* earnings growth rates.

Although he may not have been aware of the problem just stated, Harris managed to avoid it by making a second simplifying assumption. While federal exemptions, deductions and tax brackets have been indexed to the consumer price index since 1985, in his model they are indexed to the earnings growth rate. This assumption prevents the progressive tax schedule from taking either a larger or smaller share of income as earnings grow over the worklife, and guarantees that the before-tax and after-tax earnings growth rates will be equal. Unfortunately, the assumption rules out one of the more

*Professor of Economics, Marquette University, Milwaukee, WI

important results of a progressive tax structure. If a progressive tax structure is not indexed, after-tax earnings will grow more slowly than before-tax earnings. If the tax structure is indexed to the inflation rate, after-tax earnings will grow more slowly (more rapidly) than before-tax earnings if before-tax earnings grow more rapidly (more slowly) than the inflation rate.

While Harris described his indexing assumption as "reasonable," he also recognized that it would affect the results. He stated that, as an alternative to the assumption he made, ". . .it could be assumed that they [deductions, exemptions and tax brackets] were indexed to the rate of inflation and that the inflation rate was lower than the earnings growth rate. This assumption would change the results presented." (p. 278)

It is no more difficult to calculate taxes on wages for each future year than it is to calculate taxes on interest for each year. Also, it is no more difficult to model the tax structure indexed to the inflation rate than it is to model the tax structure indexed to the earnings growth rate. Therefore, there is little to be gained from making the two simplifying assumptions discussed above. On the other hand, what is lost through these assumptions is some degree of accuracy (by indexing the tax structure to the wrong variable) and some degree of flexibility (by failing to separate out the inflation rate from the earnings growth and discount rates). Simply by introducing one additional variable (the inflation rate) into the model, one can achieve greater accuracy and flexibility in the calculation of after-tax awards by indexing the tax structure to the inflation rate rather than the earnings growth rate, allowing the before-tax earnings growth rate to differ from the inflation rate, and allowing the before-tax earnings growth rate to differ from the after-tax earnings growth rate, which in fact is a usual result of progressive taxation. Finally, since the inflation rate has been identified by others as a key variable in the comparisons of before-tax and after-tax awards (Slesnick and Dolin 1983), it is best to treat it as an explicit variable.

In the present study, some of Harris' results were first replicated using an electronic spreadsheet program.[1] Then his model was modified in the following ways: (1) In calculating both before-tax and after-tax awards, the same before-tax earnings growth rate was assumed, and the correct amount of taxes on wages was calculated separately for each year; (2) the inflation rate was introduced as an additional variable in the model, and the federal and state exemptions, deductions and tax brackets were indexed to the rate of inflation rather than to the rate of earnings growth.

Table 1 illustrates the effect on the after-tax award of varying the inflation rate while holding all other variables constant for one of the cases presented by Harris, involving a single taxpayer with before-tax base earnings of $60,000, a before-tax earnings growth rate of 5%, a discount rate of 7% and a worklife expectancy of 20 years. As the inflation rate varies from 0% to 10%, the after-tax award varies from $785,383 to $861,013 and the amount of overcompensation varies from $204,780 (26.1%) to $129,150

[1]There are very minor errors in the state tax data in the appendix to Harris' paper (p. 290). In the $5,000-$17,000 income range, the tax should be $150 (not $120) plus 5% of the amount over $5,000, while in the range of income over $17,000, the tax should be $750 (not $720) plus 5.75% of the amount over $17,000. These errors were incorporated into some of his calculations. Fortunately, his results are not materially different from results obtained using the correct state tax figures.

(15.0%).[2] At the same time, the average compound *after-tax* earnings growth rate varies from 4.49% to 5.70%, despite a constant *before-tax* earnings growth rate of 5.0%. Only in the special case where the inflation rate equals the earnings growth rate is the after-tax award the same as that shown by Harris, and only in this special case is the after-tax earnings growth rate equal to the before-tax earnings growth rate. The general pattern of results described here holds for all the cases considered by Harris.

Table 1
A Comparison of Before-Tax and After-Tax Damage Awards with Varying Inflation Rates
(earnings = $60,000, wage growth = .05, discount = .07, worklife = 20 yrs., single taxpayer)

Inflation	Lump Sum		Overcompensation	
Rate	Before-Tax	After-Tax	Amount	Percent
0%	$990,163	$785,383	$204,780	26.1
1%	$990,163	$789,242	$200,921	25.5
2%	$990,163	$794,025	$196,138	24.7
3%	$990,163	$799,841	$190,322	23.8
4%	$990,163	$806,854	$183,309	22.7
5%	$990,163	$815,237	$174,926	21.5
6%	$990,163	$822,902	$167,261	20.3
7%	$990,163	$830,697	$159,466	19.2
8%	$990,163	$839,850	$150,313	17.9
9%	$990,163	$850,679	$139,484	16.4
10%	$990,163	$861,013	$129,150	15.0

Of course, large swings in the inflation rate are not likely to occur independently of the earnings growth rate and the discount rate. Nonetheless, it is useful to have the flexibility to vary these three variables independently. Not all forensic economists predict the same relationships among these variables, and they generally do *not* posit an equality between the inflation rate and the earnings growth rate.[3]

One final note about the role of inflation. In his Tables 7-10, Harris showed the effect on the after-tax awards of changes in the absolute levels of the earnings growth rate and discount rate. Specifically, he showed results when both variables were equal at the values .04, .06, .08 and .10, respectively. Increasing the absolute levels of both variables in tandem produces

[2]Since Harris indexes the tax structures to the earnings growth rate, the after-tax award for the 5% inflation rate in my Table 1 corresponds to the after-tax award for the 20-year worklife he reports in his Table 3. The slight difference in results for this case (my $815,237 vs. his $815,832) is due to the state tax error described in the previous note.

[3]In a recent survey, NAFE members were asked what values for these variables they would use for a 30-year loss projection. The median values were as follows: 4.0% for the rate of inflation, 1.5% for the *real* earnings growth rate, and 2.5% for the *real* discount rate. See the responses to questions 3, 5 and 7 of the survey. (Brookshire and Slesnick 1993)

relatively large changes in the after-tax awards, with the extent of overcompensation decreasing or undercompensation increasing as a result. Nowhere in this section does Harris mention inflation, but surely the most likely cause of such simultaneous increases in the earnings growth rate and the discount rate would be an increase in the inflation rate. The general effects of such inflationary increases were previously demonstrated in an often overlooked paper by Slesnick and Dolin (1983) and more recently confirmed by Brush and Breeden (1994). This provides another argument for treating the inflation rate as an explicit variable.

References

Brookshire, Michael and Frank Slesnick, "1993 Survey of NAFE Members: A Follow-Up Survey of Economic Methodology," *Journal of Forensic Economics*, Winter 1993, 7(1), 25-46.

Brush, Brian C. and Charles H. Breeden, "Income Taxes and Economic Damages," *Journal of Legal Economics*, Summer 1994, *4*(2), 51-63.

Harris, William G., "The Distributional Effects of Using a Before-Tax Standard in Damage Awards," *Journal of Forensic Economics*, Fall 1994, 7(3), 275-91.

Slesnick, Frank L. and Richard A. Dolin, "The Impact of Inflation Upon Compensation Awards," *University of Dayton Law Review*, Spring 1983, *8*(2), 307-332.