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Main Heading: Dueling Economists in Personal Injury and Wrongful Death Litigation

Summary: Economist experts duel it out in personal injury and wrongful death cases, and both plaintiff and defense attorneys need to know the key issues of expert disagreement.

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The media often draws attention to fiery debate between “dueling” lawyers. Economists, whose oratory tends to be more dry and staid, are also famous for intellectual duels – on matters of public policy¹.

In a typical personal injury or wrongful death case the notion of economic damages may be relatively straightforward, yet economists have found ways to disagree here too: some produce damages estimates consistently higher than that of others. Attorneys experienced in the use of economists as experts can, by trial and error, figure out which economists offer high estimates, and which offer low ones. But what about the less experienced attorney? If on the plaintiff side, a query among members of their local Trial Lawyers Association may provide some goods leads in finding an economist expert. On the defense side a corresponding query might be made to the Defense Research Institute or insurance companies that the defense works with. Whatever the result, it is worthwhile to inspect a candidate expert in terms of his or her disposition to produce damage estimates congenial to the plaintiff or, instead, to the defense.

Econo-Speak

Suppose your client is involved in personal injury litigation² wherein a plaintiff who was physically injured is making a claim of negligence against the defendant. Suppose also that the injured party had been working until the time of injury, earning \$B per year at that point, but is unable to work after the injury. The injury occurs in year i , and the trial date is in year t .

As an attorney you can attempt to estimate economic damages stemming from lost earnings, but suppose you value some additional confidence and so seek the opinion of an economist. When the economist examines the evidence he or she will take the base earnings \$B and extrapolate it

¹ See for example the “blog” site (becker-posner-blog.com) of Gary Becker (Nobel laureate economist) and Richard Posner (economist, law professor, and U.S. Court of Appeals judge).

² In the remainder of this article, I focus on personal injury cases but the discussion is also useful for wrongful death cases.

forward. Extrapolation will rely on assumptions about earnings growth rates, and for future (post-trial) earnings it will also rely on assumptions about discount rates – with which future earnings are reduced to the present value (at trial date).

The term *extrapolation* is in the vernacular, but the terms *discount rate* and *present value* are not. It gets worse, as the economist's jargon relies on mathematical symbols like \$B, *i*, *t* and others also. Let *n* be the last year of projected work, let *E* denote projected earnings, and let *R* denote the discount rate. This pile of mathematical symbols serves as input to the determination of economic damages.

The economist's estimate of damages, in lump sum form, follows the mathematical recipe:³

$$\text{Damages} = \text{Sum}(\text{Past Earnings}) + \text{PV}(\text{Future Expected Earnings})$$

In this recipe, projected earnings up until trial date are added together, producing the sum:

$$\text{Sum}(\text{Past Earnings}) = E_{t+1} + E_{t+2} + \dots + E_t$$

To this, the present value of future lost earnings is added:

$$\text{PV}(\text{Future Expected Earnings}) = \frac{E_{t+1}}{1 + R_{t+1}} + \frac{E_{t+2}}{(1 + R_{t+2})^2} + \dots + \frac{E_n}{(1 + R_n)^{n-t}}$$

To bring damages from the world of mathematical symbols to dollars and cents, the economist uses existing evidence and any relevant statistics to first attach number values to all the symbols, then cranks through the damages equation to get a damages estimate.

To compare one talking economist head to another, it is useful to know how each one interprets the fundamental damages equation (*Damages*, above), but at some level this becomes daunting due to the equation's mathematical abstraction and complexity.

Lingua-Franca

The economist expert witness knows that the court does not understand economics jargon, and so explains damage estimates in more familiar terms -- a lingua franca, if you will. Projected earnings (*E*), obtained by extrapolating base earnings forward in time, are simply an estimate of what the injured person could reasonably have been expected to earn, but for the injury. The projected end-year *n* of worklife could be retirement age, or instead a lesser number that reflects the chance of being without work at some point before then. The discount rates (*R*) are interest

³ This formula assumes no pre-trial interest, and represents the market equilibrium value of the projected earnings stream. For discussion and references to the financial economics literature see "The Value of Future Earnings in Perfect Foresight Equilibrium" (Scott Gilbert, *Journal of Forensic Economics*, Volume 12(1), year 2011). For brevity I will ignore some practical limitations of this formula, such as non-availability of bond contracts for some maturities, and the effect of tax on interest income. I also ignore other economic damage elements such as pensions and loss of productivity and enjoyment outside the workplace.

rates – or *yields* – on government bonds or similarly safe investment vehicles, with longer-term bonds used to discount earnings that arrive later. The present value of future earnings is that amount of money, available at the trial date, just sufficient to fund the payment of projected earnings. Counting up the post-trial years, there are $n-t$ of them, as so the relevant fund sets aside $n-t$ chunks of money, one for the first post-trial year, one for the second, and so on. These chunks are represented by the various terms that get added together in the economist's present value equation.

Battleground

Let's apply our lingua franca to describe the battleground in economic damages estimation. First, the projection of earnings into the future is not automatic, but itself relies on assumptions and/or statistics that are subject to choice by the economist. That is, different economists may well have different earnings projections, which impacts economic damages. Imagining the damages equation as a machine, there is a series of “ding” sounds as earnings in successive years get switched from economist's projection to another's. The higher are the projected earnings, the higher is the damages estimate.

Economists can disagree in other ways, holding different views about the length of work-life, or about discount rates. An estimate of work-life is a projection as far into the future as the economist will go, in examining earnings loss, and the more distant future is harder to foresee. It is therefore unsurprising to find some disagreement here, despite use of sophisticated statistical analysis. The key point is that a longer work-life makes for a bigger damages estimate.

It is perhaps more surprising to find real disagreement about discount rates, as these are simply interest rates (or yields) available on government bonds/bills/notes at the time of trial. These yields are public information about the bond market, akin to price information in the market for computers, say. In the computer market, the price of a given product can vary across location or delivery method, but in the bond market there is no retail overhead or other large transaction cost, so yields on one-year bonds tend to be pretty uniform, as do yields on two-year bonds, etc. There are, however, often large differences in yields on short-term bonds and long-term bonds, with a 1-year bond typically having a yield lower than that of a 30-year bond.

Heterogeneity in yield across bond duration, also called the term structure of interest rates, is itself not enough to making economists disagree about damages, so long as they hold the same information about yields. Plugging in all the yields into the damages equation, the result must be the same if the inputs are the same. However, a twist comes in that some economists will decline to use information on both short- and long-term bonds, and instead choose a single bond's yield. This approach is consistent with the damages equation if all yields are the same – a “flat” term structure. If, though, yields are heterogeneous then two such economists can produce quite different damage estimates, provided that they choose bonds of different maturities.

Dog Tags

We can now identify those economists more likely to produce higher damage estimates, and those likely to produce lower ones. Higher estimates will come from those economists who assume longer work-lives, higher projected earnings, and lower discount rates. Lower estimates will come from those who assume shorter work-lives, lower projected earnings, and higher discount rates. To examine economists, on the key matter of discount rates, ask them the following:

Question to Economist: *In bringing future earnings to present value, do you use a single discount rate, or instead a schedule of different rates for future earnings periods? If you use a single rate, how do you pick the maturity of bond for that discount rate?*

If an economist answers by saying he uses a schedule of different rates, he is applying the present value formula with both short-maturity and long-maturity bond yields, and his damage estimate is likely to be lower than that of an economist using a single short-maturity bond, while higher than that of an economist using a single long-maturity bond. For an injured party with 10-20 projected years of additional work after the trial date, a 1-year bond would be considered short-maturity, while a 20-year bond would be long-maturity. Some economists use a single rate at a maturity about half-way through the plaintiff's projected worklife, and this may produce a damage estimate similar to that of an economist using a schedule of different rates, or may not – depending on the term structure of interest rates.

Plaintiff's attorney might gladly pursue the economist that uses only a short-maturity yield, but be cautioned that this economist is not applying the damages formula in a straightforward way, and must have a good explanation ready for the defense. A possible rationale is that it's easier for a jury to understand a damages estimate based only on a single bond/yield, and easier to understand the interest rate on a 1-year bond than the yield on a 10-year bond. Danger lurks here, as the economist is unqualified to opine on a jury's capabilities. Another rationale is that it's relatively easy for the plaintiff to take a lump-sum damage award, buy short-term Treasury bills with it, and upon maturity take the proceeds and buy more, and so on, "rolling over" the amount and drawing out funds as needed to match projected earnings. But if short-term yields vary over time then there is no assurance that this method will actually deliver the requisite earnings. It may instead facilitate more earnings than needed, or less. In either case, the short-term rollover method does not adhere to the economic damages formula (shown earlier) because it leaves as question marks yields at longer horizons.

The defense attorney may be attracted to the economist that uses only a long-maturity yield, but again this is not a straightforward application of the damages formula, so danger again lurks. A safe approach is to avoid this economist and use one that relies on a whole schedule of yields, just as on the plaintiff side.

There is a more subtle way for the defense to pursue lower economic damages. Consider the fact that earnings from year to year trend upward, with no obvious stationary path upon which to reliably adhere. Faced with this "non-stationarity" in the earnings path, extrapolation of wages into the future may be harder than if earnings were stationary. The economist, troubled by such non-stationarity, might abandon the task of projecting future earnings per se, and instead focus

on the ratio between earnings growth and the interest rate⁴, with the hope that this relationship remains stationary even though earnings themselves do not.⁵ The present value formula (shown earlier) entails a ratio of this kind, in fact a whole set of them – all of which are combined to produce present value. Thinking of these ratios as random variables hovering about the same stationary level, and assuming for simplicity that the term structure is flat, the economist may use an historical average of past ratios of this sort, as an estimate of their future level. Substituting this historical average for each ratio (in the formula), a crank of the formula spits out an economic damages estimate.

To put the historical (growth-discount) rate method to advantage for the defense, note that interest rates are a lot lower now than then they were in decades past. Recalling that higher yields beget lower damage estimates, an historical growth-discount rate gains potential appeal to the defense.⁶ With earnings growth that varies over time, the story is not so simple, as the historical growth-discount rate reflects both earnings growth and interest rates. But if earnings growth's forecast is not greatly below historical average growth, whereas the current interest rate is much below its historical average, the historical growth-discount rate method can produce a damages estimate much smaller than methods based on current discount rates and earnings forecasts.

A danger in using the historical rate method is that, if the economist that uses this method does so because he cannot produce a reliable estimate of the plaintiff's earnings path, the economist's opinion is not obviously useful. Juries can and do extrapolate forward when considering economic damages in personal injury cases, with or without an economist's help. Too, outside the courtroom economists provide professional forecasts, some of which can be harnessed by the expert in the courtroom, even if that expert is not qualified to make their own.

Example

Suppose that a 30 year-old woman visits a park near her home in Illinois, with her children, and falls off a swing whose chain unexpectedly breaks, causing serious and long-term injury to her leg, hip, and back. Medical expert reports indicate she is no longer able to work that involves standing or sitting for more than 30 minutes at a time. At the time of injury (year 2011), she was working full-time and earning \$35,000 per year, and held a Bachelor's college degree. She sues the school system for negligence, and her lawyer hires an economist to estimate economic damages, with a scheduled trial date in year 2013. In terms of earnings loss, the economist takes the base income of \$35,000 and sets to work estimating pre-trial "past" earnings and post-trial "future" earnings, using existing evidence, published statistics, and possibly other relevant data.

Suppose that the economist assumes the plaintiff would have worked an additional 32 years -- but for the injury – with earnings growing by 1.9 percent in year 2012, 2.1 percent in year 2013,

⁴ Or, more precisely, on the ratio $(1+G)/(1+R)$, where G is the earnings growth rate and R is the yield.

⁵ See "Valuation of Earnings Using Historical Growth-Discount Rates" (Rolando Pelaez, *Journal of Forensic Economics*, Volume 5(1), year 1991).

⁶ For more discussion of this method see the article "Economic Controversy in Personal Injury Cases" (*Journal of the Missouri Bar*, January – February 2012).

2.4 percent in year 2014, and 2.6 percent in years 2015 onward⁷. The economist can then project forward from the base year to get each successive year's estimated earnings. All that remains, to apply the damages formula, is to specify the yields that appear in the present value part of the formula, then turn the mathematical crank on the formula.

Yields, in the year 2013, have been lower on short-term bonds than on long-term bonds. Suppose a 1-year government bond has a yield of 0.1%, a 30-year bond has a yield of 4%, and that the term structure is a "straight line" connecting the 1-year and 30-year bonds for example.⁸ Turning the crank on the damages formula produces the estimates appearing in the first row of the following table:

<u>estimation method</u>	<u>economic damages</u>
forecast earnings, use yield curve	\$1,105,062
forecast earnings, use short-term yield	\$1,625,343
forecast earnings, use long-term yield	\$917,654
historical growth-discount rate	\$749,311

As shown, economic damages are about 1.1 million dollars when based on a full range of yields. If instead only on a short-term (1 year) yield is used, damages far exceed a million (2nd row of table), while if only a long-term (30 year) yield is used then damages are somewhat less than a million (3rd row of table). The table's last row shows the damages estimate based on the historical growth-discount rate method⁹, which is substantially lower than all the others.

Bottom Line

In personal injury and wrongful death cases, both plaintiff and defense should prefer an economist that takes a straight-laced approach to implementing the economic damages formula, unless they are willing to risk something more cavalier. While I have left out many additional factors that economists often deal with in personal injury and wrongful death cases, the discount rate question provides a simple way to gauge an economist's fit as an expert witness for your clients.

⁷ Earnings growth rates here match the Consensus Economics (consensuseconomics.com) employment cost growth rates/projections as of 8/16/2013.

⁸ These short- and long-term yields match market U.S. Treasury (Constant Maturity) values as of 8/16/2013, and the straight-line yield curve simplifies exposition but could be dispensed with – by using yields at maturities 2 years, 5 years, etc.

⁹ Here I use data on historical employment cost from the U.S. Bureau of Labor Statistics (Employment Cost Index, Historical Listing, Volume III, Table 1, July 2013) for all reported past years (2001-2012), averaging quarterly values to produce annual values. For the discount rate, I use the yield on a 10-year U.S. Treasury bond, with yield data from the Federal Reserve Board (Selected Interest Rates (Daily) - H.15, online at federalreserve.gov, downloaded 8/16/2013).