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PERSONAL INJURY LITIGATION- THE DIFFERENCE BETWEEN FUTURE EARNINGS AND FUTURE EARNING CAPACITY

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This paper discusses an important issue that can arise in calculating economic damages in personal injury litigation. The issue is the difference between a person's *future earnings* and a person's *future earning capacity*. Earnings are defined as remuneration of a worker for services performed during a specific period.[1] When projecting future earnings, the economist is projecting the amount the person *would* have earned but for an injury. When projecting future earning capacity, the economist is projecting the amount the person *could* have earned if he or she had chosen to maximize earnings.

In personal injury litigation where the injured party remains alive, the correct measure of damages is loss of future earning capacity; the amount the injured party could have earned had the injury not occurred less the amount he could earn with the physical or mental impairments caused by the injury. In wrongful death litigation, where the injured party is deceased, the measure of damages is the financial support the survivors would have received from the injured party. The starting point in calculating the support is the projected earnings of the deceased: the amount the deceased would have earned from which support could have been paid to the survivors.

The difference between projected earnings and projected earning capacity can be large or small depending on the demographic characteristics of the injured party (e.g., age, gender, education, race/ethnicity, aptitudes, interests, and physical limitations) and their individual life choices (e.g., labor force participation, place of residence, choice of occupation, and retirement plans). An example of a large difference between earnings and earning capacity is a person who leaves the labor force to provide child care. The person's cash earnings may fall to zero, but the person's earning capacity in the short-run does not decline.

When the injured party is a young person who has not established a career and perhaps has not completed his or her formal education, the economist must rely more heavily on statistics for the average person with the demographic characteristics of the injured party. When the injured party is an older person, with a lengthy work history and who has known retirement

[1] Bureau of Labor Statistics. Glossary. Available at: http://www.bls.gov/bls/glossary.htm

plans, the economist can base his projections more on the specific characteristics of the injured party and rely less on statistical averages.

Projecting Future Earnings Using Worklife Expectancy

An important concept in projecting future earnings is worklife expectancy, defined as the average number of years that a person will spend in the labor force, either employed or actively seeking employment, during the remainder of his or her life. Worklife includes periods of unemployment if the person is actively looking for work. It does not include periods where a person is not in the labor force for any reason.[2]

The Bureau of Labor Statistics ("BLS") collects data to calculate worklife expectancy for various demographic groups and periodically publishes the statistics.[3] There are also individuals and companies that publish statistics on worklife expectancy.[4] While worklife expectancy statistics do not change substantially from one year to the next, they have changed over time due to social and economic factors. Therefore, it is good practice to use published statistics that use the most recent BLS data.

When calculating economic damages using worklife expectancy statistics, there are potential mistakes the economist should avoid. First, worklife expectancy covers the probability that a person will be alive from year to year, and the probability that the person will not be in the labor force due to disability and other factors. However, since an unemployed person seeking work is part of the labor force, a person can be involuntarily unemployed during part of his worklife. Therefore, each year's projected earnings must be reduced by the probability the person would be unemployed. As we discuss below, the BLS publishes statistics on unemployment rates for many demographic groups that can be used to calculate this factor. The BLS statistics can be combined with projections of total unemployment rates, published annually

[2] Bureau of Labor Statistics. Worklife Estimates: Effects of Race and Education. Bulletin 2254. February 1986.
[3] Bureau of Labor Statistics. Current Population Survey (CPS). Available at: http://www.bls.gov/cps/
[4] Richards and Donaldson, Life and Worklife Expectancies, Second Edition, 2010, p. 55

by the Social Security Administration, to project the probability of future unemployment for an injured party.

Second, a person's worklife need not be continuous. There are periods before final separation from the labor force when people leave the labor force voluntarily for education, to care for children or other relatives, to pursue personal interests, because of incarceration, or because they are discouraged and stop seeking a job. Therefore, an economist should not assume that a person age 22, with a worklife expectancy of 42 years, will be continuously in the work force for the next 42 years, and then retire fully and permanently at age 64. For many people, it is reasonable to assume final retirement will occur no sooner than the age they are eligible for full Social Security benefits (age 67 for the majority of people now in the labor force), and others may state their intention to remain in the labor force even longer.

There are published statistics estimating years to final separation from the labor force (due to retirement or death) for individuals based on sex, level of educational attainment, and initial labor force participation status.[5] These statistics provide a reasonable basis, for an assumed retirement date, when no intention to retire was stated or when the individual was already working after reaching the age of full Social Security retirement eligibility.

When there is a difference in the number of years of worklife expectancy and the number of years before assumed retirement, the economist should not calculate future earnings assuming a continuous worklife. A better practice is to compute the percentage of years prior to retirement the person would be in the labor force and apply this percentage to projected earnings each year until retirement. A worklife expectancy statistic can be combined with a statistic estimating years to final separation from the workforce or the planned retirement date to calculate this percentage. For example, if a worker has a worklife expectancy of 10 years and an expected final separation from the workforce in 12 years, the best practice is to assume the worker would work 10/12^{ths} (83.3%) of each of the next 12 years. This adjustment may increase or decrease the present value of future earnings depending on whether the annual percentage increase in earnings exceeds the

[5] See, for example, statistics in "Probability Mass Functions for Years to Final Separation from the Labor Force Induced by the Markov Model," by Gary Skoog and James Ciecka. *Journal of Forensic Economics,* 16(1).

discount rate. If the annual rate of increase in earnings exceeds the discount rate, the adjustment will increase the discounted present value of earnings relative to the present value assuming a continuous worklife.

Projecting Future Earning Capacity

Worklife expectancy is the wrong concept for an economist to use to project a person's *future earning capacity,* because it excludes amounts the person could earn if continuously in the labor force from the starting point of the projection until assumed final separation. A person's physical and mental abilities largely define his human capital. An injury can reduce those abilities and deprive the person of part or all of his human capital. The injury deprives the person of the opportunity to earn money, regardless of whether the person would have fully used his human capital.

To project earning capacity, the person's potential annual earnings should be discounted by three factors beyond the person's control. These are the annual probabilities of being alive, being able to work, and being employed. Federal statistics on each factor for different demographic groups are published, but additional analysis is needed to use the statistics in projecting earning capacity.

As an example of how these factors affect a person's projected earning capacity, the tables below show the probabilities for a Hispanic male born in 1967, injured in 2017, and who is eligible for full Social Security retirement benefits at age 67.

Probability Alive

The probability of an individual being alive is based on data collected by the National Center for Health Statistics.[6] The United States Life Tables provide complete life expectancy tables for the United States based on age-specific death rates by race, Hispanic origin, and sex.

[6] National Vital Statistics Reports, United States Life Tables, 2014, Vol. 66, No.4, August 14, 2017.

For the projection, we must know the probability the person will be alive each year up to the age of retirement. In 2018, the person is 51 years old. We use data from the life table for Hispanic males to fill in the column labeled "# Surviving" which shows the number of Hispanic males surviving to the given age out of 100,000 Hispanic males who were born alive and would be the same age as the injured party. The table below shows that the number of Hispanic males per 100,000 surviving to age 50 is 95,048. That number will be the denominator for the calculation. The number surviving decreases to 94,722 for Hispanic males age 51. We divide the number for Hispanic males age 51 by Hispanic males age 50 to determine the probability (Factor) that the person will be alive. Each subsequent year's # Surviving is divided by the number for Hispanic males age 50 (95,048), to determine the probability that the person will be alive to each later age.

Table 1: Calculation of Probability Alive

Year	Age	# Surviving	Factor
2017	50	95,048	100.00%
2018	51	94,722	99.66%
2019	52	94,364	99.28%
2020	53	93,973	98.87%
2021	54	93,547	98.42%
2022	55	93,084	97.93%
2023	56	92,582	97.41%
2024	57	92,037	96.83%
2025	58	91,446	96.21%
2026	59	90,808	95.54%
2027	60	90,120	94.82%
2028	61	89,382	94.04%
2029	62	88,588	93.20%
2030	63	87,734	92.31%
2031	64	86,821	91.34%
2032	65	85,850	90.32%
2033	66	84,823	89.24%
2034	67	83,740	88.10%

Probability Able to Work

The probability that an individual is able to work is based on a model RPC developed using data from the National Health Interview Survey. The National Health Interview Survey is conducted annually by the National Center for Health Statistics, Centers for Disease Control.[7] One question in this survey asks participants, "*Does a physical, mental, or emotional problem NOW keep [person 18+] from working at a job or business?"*[8]

RPC developed a probit model[9] that provides consistent estimates of the probability of being able to work at different ages and for different groups such as Hispanic males. The probit model developed uses these independent variables: AGE, MALE (1.0 for male, 0.0 for female), four categories for race and ethnicity (HISPANIC, WHITE, BLACK, OTHER), and five categories of educational attainment (<HS DIPLOMA, HS DIPLOMA, SOME COLLEGE, 4 – YR COLLEGE DEGREE, and GRADUATE DEGREE). Except for AGE, these independent variables have only two possible values, one and zero.[10]

RPC fitted the NHIS survey data to find probit model coefficients for each independent variable. The coefficients can be used to calculate the number of standard deviations from the mean of a cumulative normal distribution, and to produce probability tables. From the initial probability tables, RPC calculated the conditional probability an individual will be able to work knowing the individual already reached a certain point in his work life. This is done by dividing the base probability the individual will be able to work in a future year by the probability the individual was able to work in the last full year the individual actually worked. If the individual has no full year of established ability to work, the base probabilities are used unadjusted.

RPC used the data to create tables showing estimates of the probability able to work for ages 18 – 84 for: white males, Hispanic males, black males, other males, white females, Hispanic

[7] Centers for Disease Control and Prevention. National Health Interview Survey. Available at: http://www.cdc.gov/nchs/nhis.htm
[8] *Ibid.*
[9] A probit model is an econometric model in which the dependent variable can be only one or zero.
[10] All variables except for age are called dummy variables. These binary numbers can only have one of 2 values. In this model, those values are zero and one. Dummy variables are used as a means to compare two different groups or subsets of people.

females, black females, and other females; each at various levels of educational attainment. The table below shows the probability able to work for a Hispanic male with a college degree from ages 52 – 66. From the estimated "% Able," we calculated a probability factor for each age. This factor is the probability an individual will be able to work each future year relative to the last full year the individual was able to work.

Table 2: Probability Able to Work-Hispanic Male, Bachelor's Degree[11]

Year	Age	% Able	Factor
2016	49	98.66%	100.00%
2017	50	98.61%	99.94%
2018	51	98.54%	99.88%
2019	52	98.48%	99.81%
2020	53	98.42%	99.75%
2021	54	98.35%	99.68%
2022	55	98.28%	99.61%
2023	56	98.20%	99.53%
2024	57	98.13%	99.46%
2025	58	98.05%	99.38%
2026	59	97.97%	99.29%
2027	60	97.88%	99.21%
2028	61	97.80%	99.12%
2029	62	97.71%	99.03%
2030	63	97.61%	98.93%
2031	64	97.52%	98.84%
2032	65	97.42%	98.74%
2033	66	97.31%	98.63%
2034	67	97.21%	98.52%

[11] Calculated using data from National Health Interview Survey, 2014, Centers for Disease Control and Prevention, National Center for Health Statistics

Probability Employed

To determine the probability a person is employed each year, we first determine the relative rate of employment of an individual's demographic group, and then apply it to the average historical employment rate for all persons shown in Table 3. The probability of employment is calculated using these steps:

A. The column labeled "Historical Employment by Race and Sex" is calculated by taking the average of 1 minus the average unemployment rate[12] for the specific demographic group over the twelve months of each year from 1984 – 2017.
B. The column labeled "Historical Employment" is calculated by taking the average of 1 minus the average unemployment rate for all individuals over the twelve months of each year from 1984 – 2017.
C. The third step is to input the Social Security unemployment rate projections to the row labeled "Actual or Projected Unemployment." For the current year and previous years, we use the yearly unemployment rate from the BLS.[13] For future years, we use data from the OASDI report.[14] "Actual or Projected Employment" is calculated as 1 minus "Actual or Projected Unemployment."
D. The "Relative Employment Rate" is the ratio of "Actual or Projected Employment" to "Historical Employment."
E. The "Projected Employment Rate" adjusts the "Historical Employment by Race and Sex" by the "Relative Employment Rate."

[12] Bureau of Labor Statistics: www.bls.gov. Labor Force Statistics from the Current Population Survey, Unemployment Rate
[13] *Ibid.*
[14] Social Security Administration: www.ssa.gov. OASDI Trustees Report, July, 2018, Table V. B2 - Additional Economic Factors

Table 3: Probability Employed – Hispanic Male

Year	Age	Historical Employment by Race and Sex	Historical Unemployment	Historical Employment	Actual or Projected Unemployment	Actual or Projected Employment	Relative Employment Rate	Projected Employment Rate
2017	50	93.99%	6.07%	93.93%	4.40%	95.60%	101.78%	95.66%
2018	51	93.99%	6.07%	93.93%	4.40%	95.60%	101.78%	95.66%
2019	52	93.99%	6.07%	93.93%	4.90%	95.10%	101.25%	95.16%
2020	53	93.99%	6.07%	93.93%	5.30%	94.70%	100.82%	94.76%
2021	54	93.99%	6.07%	93.93%	5.50%	94.50%	100.61%	94.56%
2022	55	93.26%	6.07%	93.93%	5.50%	94.50%	100.61%	93.83%
2023	56	93.26%	6.07%	93.93%	5.50%	94.50%	100.61%	93.83%
2024	57	93.26%	6.07%	93.93%	5.50%	94.50%	100.61%	93.83%
2025	58	93.26%	6.07%	93.93%	5.50%	94.50%	100.61%	93.83%
2026	59	93.26%	6.07%	93.93%	5.50%	94.50%	100.61%	93.83%
2027	60	92.83%	6.07%	93.93%	5.50%	94.50%	100.61%	93.40%
2028	61	92.83%	6.07%	93.93%	5.50%	94.50%	100.61%	93.40%
2029	62	92.83%	6.07%	93.93%	5.50%	94.50%	100.61%	93.40%
2030	63	92.83%	6.07%	93.93%	5.50%	94.50%	100.61%	93.40%
2031	64	92.83%	6.07%	93.93%	5.50%	94.50%	100.61%	93.40%
2032	65	93.53%	6.07%	93.93%	5.50%	94.50%	100.61%	94.10%
2033	66	93.53%	6.07%	93.93%	5.50%	94.50%	100.61%	94.10%
2034	67	93.53%	6.07%	93.93%	5.50%	94.50%	100.61%	94.10%

Combined Annual Adjustment to Earning Capacity

The combined annual adjustment to earning capacity is the probability that an individual will be alive, able to work, and employed. It is calculated by multiplying the three probabilities.

Table 4: Combined Annual Adjustment to Earning Capacity

Year	Age	Probability Alive	Probability Able to Work	Probability Employed	Combined Annual Adjustment to Earning Capacity
2017	50	100.00%	99.94%	95.66%	**95.60%**
2018	51	99.66%	99.88%	95.66%	**95.22%**
2019	52	99.28%	99.81%	95.16%	**94.30%**
2020	53	98.87%	99.75%	94.76%	**93.45%**
2021	54	98.42%	99.68%	94.56%	**92.77%**
2022	55	97.93%	99.61%	93.83%	**91.53%**
2023	56	97.41%	99.53%	93.83%	**90.97%**
2024	57	96.83%	99.46%	93.83%	**90.36%**
2025	58	96.21%	99.38%	93.83%	**89.71%**
2026	59	95.54%	99.29%	93.83%	**89.01%**
2027	60	94.82%	99.21%	93.40%	**87.85%**
2028	61	94.04%	99.12%	93.40%	**87.05%**
2029	62	93.20%	99.03%	93.40%	**86.20%**
2030	63	92.31%	98.93%	93.40%	**85.29%**
2031	64	91.34%	98.84%	93.40%	**84.32%**
2032	65	90.32%	98.74%	94.10%	**83.91%**
2033	66	89.24%	98.63%	94.10%	**82.82%**
2034	67	88.10%	98.52%	94.10%	**81.68%**

Projecting the Earning Capacity of Young Persons

When the injured party is a child or young adult who has not established a career and perhaps has not completed his formal education, the economist must rely more heavily on statistics for the average person with the demographic characteristics of the injured party. However, it is important to consider any available information on the injured party in reaching an economic opinion.

If the individual has completed his or her formal education, we can project future unadjusted earnings based on gender, age, race, and educational attainment. RPC relies on the tabulations of projected age-earnings calculated in Expectancy Data's *Full-time Earnings in the United States*,[15] which are based on the American Community Survey of the United States Census Bureau.

If an individual has not completed his or her formal education, we must project final educational attainment, a critical predictor of future earnings. RPC projects final educational attainment for minor children using the ordered probit model of Kane, Spizman, and Donelson.[16] This model uses as independent variables a child's race and sex, whether the child's family lives in a rural or urban area, the family's religion and income level, the parents' years of schooling, whether the child has siblings, whether both parents live in the household, and the mother's age when she first gave birth. The model projects the probability a child will reach each of eight levels of educational attainment.[17] Once a child's final educational attainment is projected, lifetime age-earnings can be projected using data from *Full-time Earnings in the United States*.

Conclusion

To summarize, in wrongful death litigation where the injured party is deceased, one element of damages to the survivors is the support they could collectively have expected from the deceased. This support is the amount the injured party *would* have earned considering personal consumption and other information specific to the case. In projecting expected earnings, it is appropriate to use worklife expectancy statistics. To properly use these statistics, the economist must consider first, how the person's worklife would have been distributed over his years to final separation from the labor force, and second, what adjustment is necessary to account for involuntary unemployment.

[15] Expectancy Data. Full-time Earnings in the United States, 2015.
[16] Kane, John, Lawrence Spizman, and Don Donelson. Educational Attainment Model for a Minor Child: The Next Generation. *Journal of Forensic Economics*, 24(2). 2013.
[17] The levels of educational attainment considered are less than high school, GED or equivalent, high school diploma, Associate's degree or some college, BA or BS, Master's degree, PhD, or professional degree such as MD or JD

In personal injury litigation where the injured person is alive to receive an award, the measure of damages is lost future earning capacity. Earning capacity is the amount a person *could* earn if he used his education, experience and abilities to the maximum in the labor market in which he resides. The economist should discount the person's potential annual earnings by the probabilities he will be alive, able to work, and employed.

In personal injury litigation where the injured person is young, lifetime age-earnings are projected based on gender, age, race, and educational attainment. Final levels of educational attainment must be projected for minor children who have not completed their formal education.

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