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Economic Loss Due to the Death of John Doe

John Doe was born May 23, 1969. He died February 28, 2008. He was then 38.8 years old. Using tables published by the Centers for Disease Control in Arias (2007), the life expectancy of a white male of that age is 39.258 years.¹ According to Millimet, Nieswiadomy, and Slottje (2010), the expected worklife of an employed, married white male with no children at the age of 38 is 24.061 years.² Table 1 summarizes critical dates pertaining to estimation of the economic loss resulting from Mr. Doe's death.

¹ Arias, Elizabeth, Ph.D., Division of Vital Statistics, Centers for Disease Control, United States Life Tables 2007, *National Vital Statistics Report*, 59(9), September 28, 2011, Table A, p. 2.

² Millimet, Daniel, Nieswiadomy, Michael, and Daniel J. Slottje, "Detailed Estimation of Worklife Expectancy for the Measurement of Human Capital: Accounting for Marriage and Children", *Journal of Economic Surveys*, 2010, 24, 339-361. Worklife tables are available at <http://faculty.smu.edu/millimet/research.html>, accessed September 26, 2012.

Table 1: Critical Dates

| | <u>Date</u> | <u>Age</u> |
|--------------------------|-------------------|------------|
| Birth | May 23, 1969 | |
| Death | February 28, 2008 | 38.8 |
| Trial | October 25, 2012 | 43.4 |
| Expected End of Worklife | March 21, 2032 | 62.8 |
| Expected Death | June 2, 2047 | 78.0 |

Actual data are shown in green; future projected values are shown in black.

John Doe married Jane Doe July 5th, 1997, and they remained married until he died. They had no children.

Mr. Doe graduated with a bachelor's degree in civil engineering from the University of Washington in 1997, with honors. He had a history of employment as a civil engineer. Between graduating college and the time of his death, he worked for the town of Jupiter, Stanley Consultants, Rinker Materials, and EAC Consultants, all in Florida, and finally for the City of Beaverton, in Oregon.

Mr. and Mrs. Doe's tax returns and his W-2 statements for the years 2000 through 2007 show income earned and taxes withheld and paid. These and associated past estimated values appear in Table 2. As in Table 1, actual data are shown in green; the past estimated values are shown in blue.

The actual data reflect Mr. Doe's earning capacity under economic conditions different from those that prevailed at the

time of his death in 2008, but they, nonetheless, provide information relevant to his earning capacity at that time. In order to make data from different years comparable, I apply wage growth from the Bureau of Labor Statistics' Employment Cost Index³ for total compensation of all civilian workers between the respective years and 2008. This results in the (past estimated) values shown in blue under "Income with Wage Growth" and "Taxes with Wage Growth". (I make no adjustment to account for growth in earning capacity due to accumulated individual job experience between the respective years and 2008.) I assume that the federal taxes Mr. Doe paid on his income from employment, as a share of the federal taxes that he and his wife paid, were proportional to the share of their total income represented by his income from employment.

The state of Florida does not impose a tax on income; the state of Oregon does. Though estimated, the \$4,514 figure for 2006 is close to actual withholding because Mr. Doe worked for the City of Beaverton for eleven of the twelve months. He worked there at the time of his death. I conservatively assume that the effective state tax rate equals 7.1%, the estimated rate of withholding in 2006 and 2007. Combined with federal taxes of 10.1%, this implies a total effective income tax rate of 17.3%.

³ U.S. Department of Labor, Bureau of Labor Statistics, Employment Cost Index, Historical Listing, Continuous Occupational and Industry Series September 1975 - June 2012, Table 4, pp. 3-4.

Table 2: Data from Tax Documents and Associated Estimated Values

| | Income | | Taxes with wage growth | | | | Income Taxes |
|---------------------|--------|------------------|------------------------|-------------------|---------------|-------------------|--------------|
| | Income | with Wage Growth | Federal Taxes | State Withholding | Federal Taxes | State Withholding | |
| Fraction of Income: | | | 9.9% | 7.1% | 10.1% | 7.1% | 17.3% |
| <u>Year</u> | | | | | | | |
| 2000 | 46,114 | 60,730 | 4,790 | | 6,309 | | |
| 2001 | 64,044 | 81,100 | 9,330 | | 11,815 | | |
| 2002 | 48,758 | 59,507 | 7,298 | | 8,907 | | |
| 2003 | 32,638 | 38,358 | 3,183 | | 3,740 | | |
| 2004 | 69,176 | 78,353 | 5,446 | | 6,168 | | |
| 2005 | 84,995 | 93,257 | 9,203 | | 10,098 | | |
| 2006 | 60,483 | 64,379 | 4,533 | 4,514 | 4,825 | 4,805 | |
| 2007 | 66,293 | 68,273 | 3,213 | 4,525 | 3,309 | 4,660 | |
| Average: | | 67,994 | 9.9% | | 10.1% | | |

Two estimated values from Table 2 are used in the calculation of economic loss: base income in 2008 of \$67,994 and the total effective income tax rate of 17.3%. These are shown in boxes in Table 2. The \$67,994 in 2008 is the basis for projections of earning capacity made in this report.

In addition to his salary, as a civil engineer employed by the city of Beaverton, Mr. Doe would have been eligible for employer-paid fringe benefits, such as medical insurance coverage. According to a letter from the City to Mr. Doe dated November 15, 2005, "Per our discussion you will be a member of the AFSCME union and will receive benefits according to the terms of the collective bargaining agreement and City of Beaverton Personnel and Administrative Policies." I conservatively estimate the value of such benefits, lost because of his death, to be 10 percent of his before-tax income.

A husband's contribution to his wife's material well-being includes activities such as home maintenance and repair,

yardwork, auto maintenance, and financial management, for which he does not receive monetary compensation. In evaluating this element of the economic loss to Mr. Doe's widow, I have relied on average data derived from a study conducted by the Institute of Social Research at the University of Michigan. The results of this survey, published in *Time, Goods, and Well-Being*, edited by F. Thomas Juster and Frank P. Stafford, indicate that a married man working full time spends, on average, approximately 12.7 hours per week in these activities. This amounts to 660.4 hours per year.

In her deposition (p. 75), Jane Doe describes some of the projects John Doe completed in their home: "Even with our house projects, things around the house. He was brilliant. He could do designs, he could do all kinds of things. He built me this massive TV entertainment system in West Palm Beach, and master bedroom closet, where he would go in and he would actually design it, because we had the software at home, so he would design it on the computer, make a cut list, build it. And we had all of the professional woodworking tools. And he got so excited because the drawers in the entertainment center, he was so excited because they were a sixteenth of an inch different, so they were like identical. And the way he put things together were beautiful."

I valued such activities at \$12 per hour in 2012, which is somewhat above the hourly wage in the leisure and hospitality

industry, according to the Bureau of Labor Statistics⁴. Leisure and hospitality shows the lowest hourly wage of the major industrial categories defined in the BLS document.

I assume that income and the value of non-market services grow between 2008 and 2012 at the same rate as the Employment Cost Index. From 2012 to the end of Mr. Doe's expected worklife in 2032, I assume that income grows at an annual rate of 3.15%, based on changes in the Employment Cost Index between 1982 and 2012. (I make no adjustment to account for growth in earning capacity due to accumulation of individual job experience.) I assume that the value of non-market services grows at the same rate through 2041, approximately five years before the end of Mr. Doe's expected lifetime in 2047. Given that fringe benefits, income taxes, and personal consumption are fixed fractions of income, they also grow at the same rate as income. The "total compensation" reflected in the Employment Cost Index includes fringe benefits as well as wages and salaries.

In order to calculate the economic loss to Mr. Doe's widow Jane Doe, his personal consumption should be removed from the estimated value of his productive activity to their household. The fraction I remove is less than one half because married

⁴ Bureau of Labor Statistics, *Employment and Earnings*, Historical Hours and Earnings, Table B-2: Average hours and earnings of production and nonsupervisory employees on private nonfarm payrolls by major industry sector, 1966 to date, p. 51.

couples consume some goods, such as housing, jointly. In the language of economics, there is an "economy of scale" in consumption when the size of a household rises from one to two. This economy of scale is lost with Mr. Doe's death, and that loss is reflected in the personal consumption estimate being less than one half.

To estimate personal consumption, I refer to "equivalence scales" published by the U.S. Bureau of Labor Statistics and the Bureau of the Census.⁵ A conservative interpretation of the equivalence scales indicates estimated personal consumption of 40 percent of the sum of after-tax income, fringe benefits, and the value of non-market services.

Past economic losses occurred between 2008 and the present, and future economic losses are expected to occur between the present and 2041. Had Mrs. Doe invested past losses as they occurred, the value of those investments would have accrued to the present value of past economic loss; if she were to invest the present value of future economic loss, she would just be able

⁵ Johnson, David S., John M. Rogers, and Lucilla Tan, Bureau of Labor Statistics, "A Century of Family Budgets in the United States", Monthly Labor Review, May 2001, p. 34.

Bureau of the Census, "Adjusting Poverty Thresholds", <http://www.census.gov/hhes/povmeas/methodology/nas/files/adjust.pdf>, accessed September 25, 2012.

to withdraw funds from her investments equal to future losses as they are expected to occur.

Therefore, in order to find the 2012 present value of the lost stream of income, fringe benefits, and non-market services, less income taxes and personal consumption, past losses are compounded, and future losses are discounted, using appropriate rates of interest. The period between Mr. Doe's death in 2008 and the present has been marked by historically low rates of interest. Figure 1, reprinted from the Saint Louis Federal Reserve, shows rates on 3-month treasury bills since the 1950s, which have been nearly zero for the past few years. Accordingly, I compound past losses to the present at an annual rate of 0.1%. I discount future losses at an annual rate of 3.74%, based on recent rates on the Bond Buyer Go 20-Bond Municipal Bond Index. Figure 2 shows the history of this index since the 1950s.

Figure 1

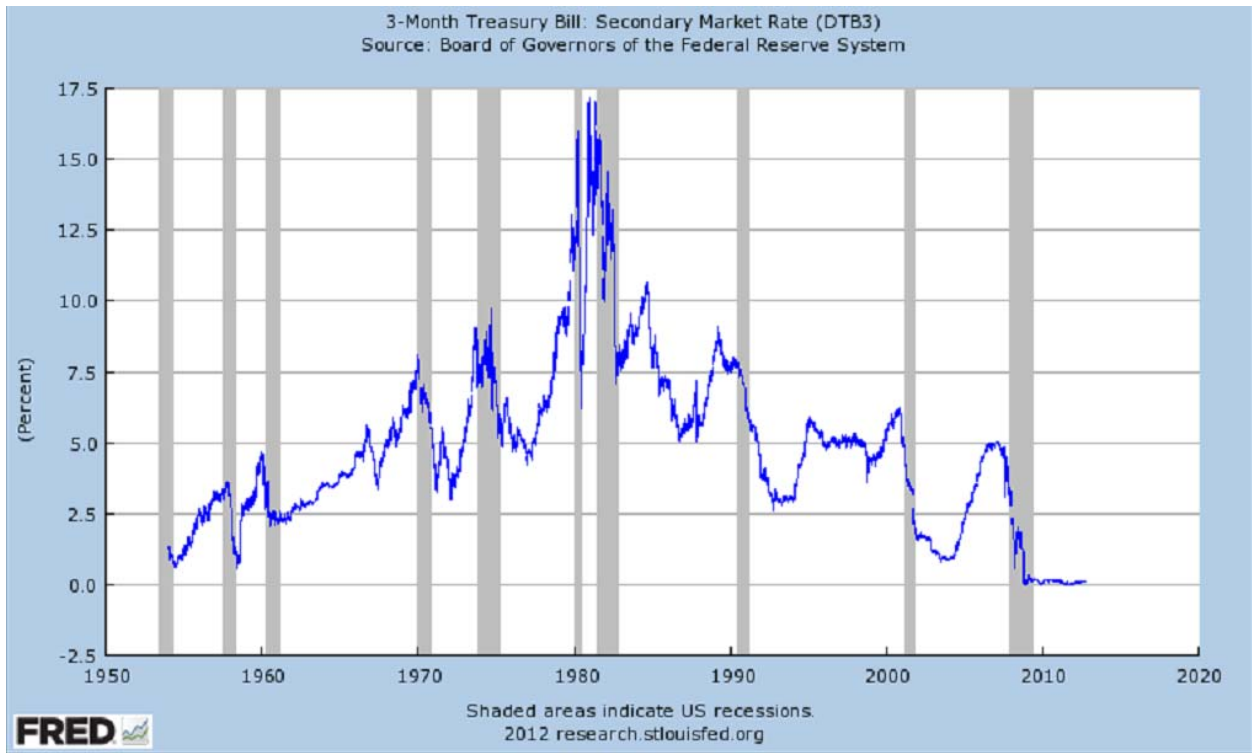


Figure 2



Table 3 shows the elements of the economic loss to Mrs. Doe in current value terms, and the present values of the losses, by year. Note that the figure for 2008 is prorated for the period subsequent to Mr. Doe's death. The present value of past economic loss is the sum of the present values of past losses, and equals \$204,248. The present value of future economic loss is the sum of the present values of future losses, and equals \$880,744. The total present-valued economic loss is the present value of past economic loss plus the present value of future economic loss, which equals \$1,084,992.

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Table 3: Elements of Economic Loss by Year

| | <u>Income</u> | <u>Fringe Benefits</u> | <u>Non-Market Services</u> | <u>Income Taxes</u> | <u>Personal Consumption</u> | <u>Current Valued Loss</u> | <u>Present Valued Loss</u> |
|--|---------------|------------------------|----------------------------|---------------------|-----------------------------|----------------------------|----------------------------|
| Future Rate of Growth or Discount: | 3.15% | | 3.15% | | | | 3.74% |
| Fraction of Income: | | 10.0% | | 17.3% | 40.0% | | |
| Annual Hours: | | | 660.4 | | | | |
| 2012 Hourly Wage: | | | \$12.00 | | | | |
| <u>Year</u> | | | | | | | |
| 2008 | 67,994 | 6,799 | 7,391 | 11,748 | 28,175 | 35,449 | 35,603 |
| 2009 | 69,137 | 6,914 | 7,515 | 11,945 | 28,648 | 42,972 | 43,115 |
| 2010 | 70,435 | 7,044 | 7,656 | 12,170 | 29,186 | 43,779 | 43,881 |
| 2011 | 71,890 | 7,189 | 7,814 | 12,421 | 29,789 | 44,683 | 44,742 |
| 2012 | 72,907 | 7,291 | 7,925 | 12,597 | 30,210 | 45,315 | 45,330 |
| 2013 | 75,200 | 7,520 | 8,174 | 12,993 | 31,160 | 46,741 | 45,584 |
| 2014 | 77,565 | 7,757 | 8,431 | 13,402 | 32,141 | 48,211 | 45,322 |
| 2015 | 80,005 | 8,000 | 8,696 | 13,823 | 33,151 | 49,727 | 45,062 |
| 2016 | 82,521 | 8,252 | 8,970 | 14,258 | 34,194 | 51,291 | 44,798 |
| 2017 | 85,117 | 8,512 | 9,252 | 14,706 | 35,269 | 52,904 | 44,541 |
| 2018 | 87,794 | 8,779 | 9,543 | 15,169 | 36,379 | 54,568 | 44,285 |
| 2019 | 90,555 | 9,055 | 9,843 | 15,646 | 37,523 | 56,284 | 44,030 |
| 2020 | 93,403 | 9,340 | 10,153 | 16,138 | 38,703 | 58,055 | 43,773 |
| 2021 | 96,341 | 9,634 | 10,472 | 16,646 | 39,920 | 59,881 | 43,521 |
| 2022 | 99,371 | 9,937 | 10,801 | 17,169 | 41,176 | 61,764 | 43,271 |
| 2023 | 102,496 | 10,250 | 11,141 | 17,709 | 42,471 | 63,706 | 43,022 |
| 2024 | 105,720 | 10,572 | 11,491 | 18,266 | 43,807 | 65,710 | 42,771 |
| 2025 | 109,045 | 10,904 | 11,853 | 18,841 | 45,185 | 67,777 | 42,525 |
| 2026 | 112,474 | 11,247 | 12,226 | 19,433 | 46,606 | 69,909 | 42,280 |
| 2027 | 116,012 | 11,601 | 12,610 | 20,045 | 48,072 | 72,107 | 42,037 |
| 2028 | 119,661 | 11,966 | 13,007 | 20,675 | 49,583 | 74,375 | 41,792 |
| 2029 | 123,424 | 12,342 | 13,416 | 21,325 | 51,143 | 76,714 | 41,551 |
| 2030 | 127,306 | 12,731 | 13,838 | 21,996 | 52,751 | 79,127 | 41,313 |
| 2031 | 131,310 | 13,131 | 14,273 | 22,688 | 54,411 | 81,616 | 41,075 |
| 2032 | 29,708 | 2,971 | 14,722 | 5,133 | 16,907 | 25,361 | 12,302 |
| 2033 | 0 | 0 | 15,185 | 0 | 6,074 | 9,111 | 4,260 |
| 2034 | 0 | 0 | 15,663 | 0 | 6,265 | 9,398 | 4,236 |
| 2035 | 0 | 0 | 16,155 | 0 | 6,462 | 9,693 | 4,211 |
| 2036 | 0 | 0 | 16,663 | 0 | 6,665 | 9,998 | 4,187 |
| 2037 | 0 | 0 | 17,187 | 0 | 6,875 | 10,312 | 4,163 |
| 2038 | 0 | 0 | 17,728 | 0 | 7,091 | 10,637 | 4,139 |
| 2039 | 0 | 0 | 18,286 | 0 | 7,314 | 10,971 | 4,115 |
| 2040 | 0 | 0 | 18,861 | 0 | 7,544 | 11,316 | 4,091 |
| 2041 | 0 | 0 | 19,454 | 0 | 7,782 | 11,672 | 4,067 |
| 2042 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2043 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2044 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2046 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Present value of past economic loss: | | | | | | | 204,248 |
| Present value of future economic loss: | | | | | | | 880,744 |
| Present value of economic loss: | | | | | | | \$1,084,992 |

Past estimated values are shown in blue.

Future estimated values are shown in black.