Gamboa-Gibson Worklife Expectancy Methods and Tables: A Summary of Criticisms Since 2009

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Abstract: *This discussion is an extended update to Thomas Ireland's 2009 paper on "Why the Gamboa-Gibson Disability Worklife Expectancy Tables Are Without Merit." That paper was intended to summarize an extensive literature that had developed by 2009 that pointed out three fatal shortcomings of the 2006 edition of Gamboa and Gibson publication The New Worklife Expectancy Tables, published by VEI, Inc. Since publication of the Ireland paper, two more editions of what would be called the Gamboa-Gibson Worklife Tables were published in 2010 and 2015. The tables themselves posed challenges that have not been addressed in the forensic economics literature. Court challenges to the methods used to compile the tables have continued, with mixed success. Employees of Vocational Economics, Inc., have largely switched from using data from the Current Population Survey to data based on the much larger American Community Survey. An important paper regarding changes in disability status has been published by Krueger and Skoog. In 2017 and 2018, a series of federal decisions rejecting use of the Gamboa-Gibson tables occurred, but employees of VEI, Inc. continue to be allowed to testify. As of March 2021, the tables themselves are no longer readily available for purchase, but employees of Vocational Economics are still using the methods used to construct the tables in current litigation. This paper discusses each of those developments.*

I.   Introduction

Thomas R. Ireland published two papers in 2009 (Ireland 2009a and 2009b) that provided explanation for why the Gamboa-Gibson

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worklife expectancy tables were then without merit. Between 2009 and April 2020, those papers have been frequently cited in litigation. Both Ireland and Frank L. Slesnick are still being retained in cases in which the methods used to construct Gamboa-Gibson worklife expectancy tables (henceforth GGWT) have been used by economic experts for plaintiffs who have maintained residual earning capacity. As of 2009, tables had been published in 1987, 1991, 1995, 1998, 2002 and 2006. In the 12 years since Ireland's papers were published, there have been a series of developments affecting use of the GGWT Tables and methods used to construct those tables. Those developments are the focus of this paper.

The 2009 Ireland papers were focused on the 2006 version of the tables (Gamboa and Gibson 2006). Since the 2009 papers, Gamboa and Gibson have published new sets of worklife expectancy tables in 2010 and 2015 (Gamboa and Gibson 2010 and 2015). An important paper was published by Krueger and Skoog (2015), showing that disability classifications used in the Gamboa-Gibson tables are remarkably unstable over time. In 2017 and 2018, a series of four federal decisions rejected testimony by persons not employed by Vocational Economics, Inc. However, employees of Vocational Economics, Inc., continue to be allowed to testify using the methods used to construct the tables. As of March 2021, six years have passed since the last publication of the tables and there are no indications that the tables will ever be published again. The purpose of this update is to discuss those developments.

Section II briefly reviews the Ireland 2009 papers (Ireland 2009a and 2009b). Section III discusses changes introduced in the 2010 and 2015 editions of the Gamboa-Gibson tables. Section IV examines the LPE and "L and PE" methods for determining worklife expectancy. Section V discusses the "L and PE" method and the issue of mitigation. Section VI responds to Challenge Issues posted in the 2015 GGWT. Section VII discusses legal decisions regarding the GGWT and methods used to produce the GGWT. Section VIII provides the paper's conclusions.

II.   The 2009 Ireland Papers

Ireland (2009a and 2009b) discussed three basic problems of the editions of the Gamboa Tables (1987, 1991, 1995, 1998, and 2002) and GGWT (2006):

(1)   The government sources from which the numbers are calculated are not reliable for measuring the prevalence of

permanent disabilities and were not designed for the purposes of measuring the prevalence of permanent disabilities.

(2) The LPE method used by Gamboa and Gibson for deriving disability worklife tables from underlying government sources is not a valid methodology for doing so.

(3) Even if the underlying government sources were reliable for the purpose of measuring disability and the method used to derive disability worklife tables were a valid methodology, the data themselves would be for a wide variety of disabilities and not applicable to an individual with a particular disability.

Ireland also discussed important papers that had been published before 2009, criticizing both the GGWT and the methods use to construct the tables.

III.   GGWT Since 2009

After Ireland's 2009 papers, new editions of GGWT were published in 2010 and 2015. Much of Ireland's criticism and references were largely based on uses of the Current Population Survey (CPS) to construct the disability worklife expectancy tables. The emphasis of the 2010 and 2015 versions of GGWT shifted from the Current Population Survey (CPS) to the American Community Survey (ACS). Both surveys are jointly conducted by the Bureau of Labor Statistics and the Bureau of the Census, but the CPS is a much smaller survey than the ACS. The current survey sample of the CPS is 60,000 occupied households, while the current survey sample of the ACS was 2,059,945 persons in 2019.

Prior to 2015, the disability questions in the ACS and CPS were somewhat different, but after 2015 the same questions were asked in both surveys. While the 2010 and 2015 editions of GGWT still include tables based upon the Current Population Survey, the emphasis is on tables based upon the ACS. In the 2015 GGWT, what had been called the CPS tables in earlier editions were referred to as "ASEC" tables (for "Annual Social and Economic Supplement"), which comes from the March Supplement to the CPS. (Unlike the ACS, data are released monthly from the CPS.) Criticisms based on uses of the CPS to create disabled and non-disabled tables that were emphasized in the 2009 papers also apply to the development of similar tables based on the ACS. Differences between worklife expectancy values shown in the GGWT based on the CPS (shown in 2015 as ASEC tables) and ACS are minor in the 2006, 2010, and 2015 versions of the tables.

There are, however, two key differences between the CPS (ASEC) and the ACS. First, detailed data for the CPS are readily available for

download from the Bureau of the Census website at *census.gov/ programs-surveys/cps.html*. Summary tables by educational category, age, and sex are provided for a variety of population groups. Earnings information by educational category can be extracted from the ACS but doing so requires becoming familiar with programs to extract data and spending a good deal of time understanding the extraction process. Earnings information extracted from the ACS is easily available only for year-round, full-time employees. Expectancy Data has extracted information about year-round, full-time earnings in its series on *Full-Time Earnings in the United States*, now available through 2019 (Expectancy Data, 2019).

Earnings for persons working other than year-round, full-time workers could be extracted from microdata of the ACS, but does not exist in an easily accessible form that is open for review. There is an advantage for a large-scale consulting business like Vocational Economics, Inc., in having the resources necessary to develop programs for use in extracting information that is not publicly available from the microdata of the ACS for its own employees and a limited number of other persons authorized to purchase such data from VEI, Inc.

Second, the CPS is designated to provide the official measure of unemployment (designated as "U-3 Total unemployed, as a percentage of the civilian labor force"), while the more recent ACS has a small number of questions that enable a reader to approximately calculate the CPS official number of persons in the labor force divided between those employed and unemployed. (Alternative measures of labor force underutilization are provided by the Bureau of Labor Statistics at http://bls.gov/news.release/empsit.t15.htm. See Kromer and Howard (2011) for a detailed comparison of ACS and CPS data on employment status.)

The general methodology used to construct the tables changed from 2006 to 2015 only in that the number of disability categories for which individual worklife expectancy tables based on the ACS increased significantly. The number of categories of tables based on the CPS/ASEC remained the same at five categories (Not Disabled, All Persons, Not Severe, All Disabled, and Severe). However, the number of categories based on the ACS increased from four categories in 2006 (Not Disabled, All Persons, Physical Disability Only, and Cognitive Disability Only) to 10 categories in 2015 (Not Disabled, All Persons, Mobility Only, Mobility Severe, Cognitive Only, Cognitive Severe, Hearing Only, Hearing Severe, Vision Only, and Vision Severe). In the process, the total number of tables increased from 105 tables in the 2006 edition to 244 tables in the 2010 edition to 410 tables in the 2015 edition.

Despite the increase in the number of additional tables added in the 2015 edition of GGWT, Gamboa and Gibson chose to simply ignore some of the ACS survey respondents. In Figure 5 on page 19 of GGWT (2015), a table of "Sample Respondents" lists 12 categories of respondents to the ACS survey. Categories 1-9 and 12 are used to create tables, but categories 10 and 11 are "unused" and therefore presumably not included in the construction of any of the tables. There is no indication of the percentage of survey respondents who fall into either of these categories or explanation for why it is deemed acceptable to omit these survey respondents. Conceivably, the omitted respondents may even include most respondents indicating a disability.

Further, in addition to ignoring a potentially large group of respondents, the 2015 GGWT tables are based on different time periods for different individuals, which in turn depend upon the disability classifications utilized by the 2015 GGWT. Footnote 22 on page 16, reads as follows:

The data for "Nonsevere Physical" and "Severe Physical" emanate from the 2005-2007 ACS disability criteria; whereas, the data for the other ten categories stem from the 2008-2012 ACS disability criteria under the new definition.

The ACS dropped the questions used to create these categories before 2007 because those questions were considered unreliable. However, responses to those questions were necessary for the creation of tables for plaintiffs with "physical disabilities." As a result, the 2015 GGWT used data from 2005-2007 for those categories while using data from 2008-2012 for all other categories.

IV.   LPE and Worklife Expectancy

The LPE method named by Brookshire and Cobb (1983) is an anacronym for Life, Participation, and Employment probabilities for persons of a specific age, sex, and educational level. It did not involve worklife expectancy tables as such. Based on those probabilities, an individual was assumed to have a worklife probability in any given future year. The underlying concept is that an individual has a worklife probability in each year of the future, based on the probabilities of being alive (L), being a participant in the labor market if still alive (P), and the probability of being employed (E) if still alive and a participant in the labor market. In a conventional LPE table, worklife probability for each year is equal to L x P x E for each year. Worklife expectancy can then be calculated as the sum of annual worklife probabilities from an individual's age at injury to age 100 (and 110 for purists). Tables are based on a person's starting age at the time of injury, the person's sex,

and the person's level of education. Thus, for example, if L = 0.98, P = 0.90, and E = 0.97 at age 40, the individual has a worklife probability of $0.98 \times 0.90 \times 0.97 = 0.855$ for the next year, which would be equal to 0.855 of a year of work life. Typically, worklife expectancies are not calculated, but would be equal to the sum of annual worklife probabilities from age 40 to age 100.

Variables in an LPE approach have different roles. There are two status variables that are assumed not to change (sex and education), one status variable that changes in a regular immutable pattern from year to year (age) and one statistical variable (probability of being in the work force) that changes from year to year as social and economic conditions change. Sex and education seldom change. Sex changes are rare, and most people do not get more education once they begin supporting themselves. A small number of people change sex or education levels, but the usual approach of analytic experts is to change the sex or educational status of persons to their new statuses if they occur. Whether an individual is a "participant" in the commercial labor market is, with few exceptions, a choice variable that can change from year to year. (There are circumstances with very severe disabilities that it is not possible for a person to find employment.)

Gamboa and Gibson in GGWT have defined various types of "disability" as separate status variables that are then used to define the population categories for which annual worklife probability will be calculated. Having invented those new categories, they develop tables by sex, education, age, and one of their disability statuses to develop worklife expectancy tables for each created disability status. There are many problems with doing so, but a major problem is that unlike sex, education and the normal pattern of aging, disability status can change greatly over time. Men only rarely become women. Most working-age people do not change education levels and age is a pattern that changes in the same way for everyone, but disability status can change significantly (and sometimes suddenly) over time. The frequency with which this occurs and the impact of that frequency on worklife expectancy has been measured by Krueger and Skoog (2015) in an especially important paper. Gamboa and Gibson assume that their disability statuses are stable over time, but Krueger and Skoog have shown, using data from the CPS for matched samples, responses to the disability questions in both the ACS and CPS change dramatically from year to year.

In addition to adding a disability variable, Gamboa and Gibson in GGWT have combined the P and E variables into a single PE rate instead of treating Participation and Employment as distinct variables. This variable is the percent of the population of the demographic category that is both currently participating in the commercial labor

market and employed. Doing so results in failing to examine issues relating to participation and employment separately, creating the problems addressed in the next section. Using the PE variable instead of separating P and E into their component parts is called the "L and PE" method by Brookshire and Forlines (2014), a description that is adopted in this paper.

V. "L and PE" and Mitigation Requirements

For an individual to be earning an income in the commercial labor market, two things are required. The individual must be willing to accept employment at an available rate of compensation and one or more employers must be willing to offer employment at a rate of compensation acceptable to the individual. An individual's decision to participate (P) in the commercial labor market and thereby become a supplier of one's own labor services is based upon the compensation rate available and the age, health, existing wealth, and financial support available to the person if not working. Non-monetary benefits such as flexibility of the job, willingness of the employer to accommodate needs of the employee such as recognition of physical limitations, work environment among employees and supervisors are also important. The decisions of employers collectively to hire employees with the qualifications of that individual (E) determine whether that individual can find employment and, if so, at what rate of compensation. This is where the motivation of the individual to seek work is important.

Given that the Gamboa Gibson Tables indicate a significant reduction in worklife assuming a presumed disability, that reduction must come from either a reduction in L, P, or E. For most cases, L is not reduced, and P and E are combined into a PE factor, which equals the employment to population ratio. The implication of combining P and E in the Tables means that how disability affects P, primarily a supply-side factor, and E, which is primarily a demand-side factor, is not considered. P and E are obviously interrelated. However, the inability to perform certain jobs due to disability does not necessarily preclude the disabled from seeking jobs in other fields where the specific disability is less of an issue. See Brookshire and Forlines (2014) for a more complete explanation of the importance of separating the P and E.

If jobs are available and the individual is capable of being employed, there may be a legal requirement for the individual take a job to offset (mitigate) the part of an earnings loss caused by the inability of the individual to return to the individual's pre-injury

earnings rate. The requirement to mitigate damages affects what may be termed "worklife capacity," which can be viewed as the potential number of years in the labor market. There are "legitimate" reasons why disabled individuals will have a lower employment rate than nondisabled individuals. Legitimate reasons would include significant discomfort in performing certain types of physical activities and general difficulty in navigating everyday events. To claim that a disability causes a reduction in work life, however, would require that few jobs remain that an individual could still perform given the individual's limitations.

Disabled persons may choose not to actively seek employment because there are benefits from not working that are more attractive than earnings from working. They may also choose not to actively seek employment because immediately obtaining a job after suffering from a disability could negatively impact any future court settlement. For persons in any given disability category, the prospects for employment may be like that of the nondisabled. That is why courts require a plaintiff attempt to mitigate damages claimed at trial.

Estimating post-injury earning capacity often requires that the vocational expert undertake a thorough analysis of the plaintiff. For example, based upon the well-known RAPEL methodology, the vocational expert will look at the possibility of a rehabilitation program, examine the functional and vocational capacities of the plaintiff, and conduct a labor market survey to determine which jobs the plaintiff could attain (Weed and Field 2012). Following a methodology such as RAPEL will help determine what steps are necessary for the plaintiff to achieve his or her worklife capacity.

Mitigation in tort cases relates to the idea that the injured party is not entitled to recover damages for any harm that "he could have avoided by the use of reasonable effort or expenditure after the commission of the tort" (Paulk 2007, 647). The mitigation question is what effort to find employment is expected of the plaintiff after an injury. Courts expect a reasonable effort, but "reasonable" may be defined differently by different courts.

As an example, consider an unskilled worker whose injury makes it difficult to do heavy, manual labor. Rehabilitation for a sedentary job that has flexible hours may be reasonable but might require significant physical therapy, advanced educational training, or moving a significant distance from the worker's home. Those requirements, taken together, may not be considered reasonable. However, as argued by Paulk (2007, 656, italics as in the original): "Despite these rare exceptions, courts are relatively unwavering in their belief that tort victims are normally able to find *some* job that will minimize their damages, as illustrated by cases where the plaintiff's claim they did not

accept alternative employment because no jobs existed." In one instance cited by Paulk, the court imputed a full-time minimum wage job despite the plaintiff's expert asserting that no such jobs existed.

In addition to the shortcomings of the Gamboa-Gibson Tables described in Sections II, III, and IV, the Tables demonstrate an insufficient emphasis on the supply-side factors that influence and motivate the disabled individual. This would be accomplished by separating the P (supply-side) factors and the E (employment-side) factors and carefully analyzing the motivational factors present concerning the plaintiff's search for employment.

VI. Challenge Issues Posed by Gamboa and Gibson

Chapter 7 of Gamboa and Gibson (2015) is entitled "Challenge Issues." This section responds to what Gamboa and Gibson have interpreted as challenges to the use of the Gamboa Gibson worklife expectancy tables. That chapter begins with a discussion of disability issues in *O'Shea v. Riverway Towing* (1982) and *Jones & Laughlin Steel Corporation v. Pfeifer* (1983). Those decisions were reached four and five years before the first edition in 1987 of what were then the Gamboa tables. They argue that Judge Richard Posner talked about disability shortening the work life of Margaret O'Shea in the *O'Shea* case and that the decision in *O'Shea* was discussed favorably in *Pfeifer* a year later. Gamboa and Gibson (2015) then discussed issues of "Broad Support" and criteria for admissibility of expert opinion in *Daubert v. Merrell Dow Pharmaceuticals* (1993) and *Frye v. United States (1923)*. This was followed by discussions of "heterogeneity" and "exogeneity." This section will generally proceed in the same order but will be selective of the topics considered.

"*Broad Support*"
The first three-fourths of page 40 of GGWT is devoted to a discussion of "Broad Support." Gamboa and Gibson point out that a great deal of research has been done regarding disability issues in general. Critics of the Gamboa-Gibson disability worklife expectancy tables have not suggested that disability issues should not be researched and discussed. The cited research is being conducted on the social and economic impacts of disability on employment and earnings and not on worklife expectancy. Thus, there is no challenge issue to be addressed.

Meeting Daubert and Frye Criteria
At page 40, Gamboa and Gibson argue that their tables satisfy the standards for admission of expert testimony that are established in

Frye v. United States (1923) and *Daubert v. Merrell Dow Pharmaceuticals, Inc*. (1993). In their "Meeting *Daubert* and Fry Criteria" section, they address the following considerations for admission of expert testimony: Testing; Peer Review and Publication; Error Rate; General Acceptance; Validity; and Reliability. The first four of those considerations are the areas considered in the *Daubert* decision. Their discussion of "Validity" and "Reliability" are not tied to the *Daubert* decision but are related to the admissibility of testimony based on the Gamboa Gibson worklife expectancy tables.

The Gamboa and Gibson discussion of "Testing" focuses on testing done by the Bureau of the Census in compiling data used in the CPS and ACS even though there is no "challenge" to the reliability of data in those surveys other than the fact that there is no cross-checking of answers given by survey participants. No one questions that data from the CPS and ACS have been used by researchers on disability issues to "publish" papers in "peer-reviewed" journals. However, this also provides no support for the Gamboa Gibson worklife expectancy tables. The tables and the methodology for producing the tables have not been published in peer-reviewed journals or otherwise subjected to any independent peer-review process. VEI employees have published papers in support of the Tables in rehabilitation journals, but those papers have never explained the methods that were used to extract information from underlying survey data (the underlying unpublished "microdata" of the surveys).

Data in the ACS and CPS are designed to show the aggregate impact of disability on the community, and to examine disability trends over time. GGWT quotes from Houtenville, et al. (2009, 3-4), as follows:

The primary rationale for government efforts to collect data and publish statistics is that they are the foundation of evidence-based public policy, providing critical information to support the management and improvement of public programs, as well as the formulation, analysis, and evaluation of new programs and policies.

This, however, does not show that data from the ACS and CPS are reliable and valid for the purpose of constructing disability worklife expectancy tables.

Reliability in this context refers to whether the measurement scale provides consistent results over time. If a method is used by different experts working with the same data, will each expert find the same result or a reasonably similar result? There is no discussion in GGWT regarding how reliability is determined for its worklife tables. By comparison, multiple studies by different researchers confirm the general reliability of the method used to construct conventional worklife expectancy tables. Those methods have been used with

different time periods and with different ways of measuring values and all confirm each other. See Smith (1986). Ciecka, Donley, and Goldman (2000), Millimet, et al. (2003), and Skoog, Ciecka, and Krueger (2011 and 2019) all used the same general methodology and arrived at consistent conclusions.

Validity refers to whether projections made using a given set of assumptions and data sources turn out to be accurate. In other words, do projections made using the method being challenged have a record of being consistent with actual results? It is an inherent problem with projections of future economic variables that their future validity cannot be tested until the time periods of the projections have ended. To accurately test validity of future projections, one would have to conduct a longitudinal study, which followed plaintiffs over time. All worklife expectancy tables have important flaws, including the lack of long-term follow-up of disabled individuals. However, for conventional worklife expectancy tables, the consistency of results both between different time frames and different researchers provide reinforcing support for such tables compared with the tables in GGWT.

Challenges Based on Heterogeneity.
One of the major criticisms of GGWT is that the individuals surveyed are so diverse that use of the Tables is meaningless. Since the disability questions posed by the government which label a person disabled are themselves so broad, any variables such as the employment rate might include individuals who were suffering from severe injuries such as a damage to the spinal cord to minor and perhaps temporary injuries such as a strained knee. The heterogeneity criticism is that only if the specific medical condition of the plaintiff, along with detailed information about the plaintiff's life circumstances and occupation, is considered could an expert develop a reliable estimate of post-injury worklife expectancy.

Gamboa and Gibson have provided several responses. First, they indicate that even though individuals in a particular group – e.g., non-severely disabled who are male and have a high school education – may suffer from a variety of impairments due to a variety of causes, that does not mean the resulting loss of employment is equally varied. On page 44 of the Tables, VEI cites two studies to allegedly support this argument, but neither article seems applicable. One was a study by Bolton, Bellini and Brookings (2000) that examined which of the major phases of the vocational rehabilitation service process predicts employment outcomes. The other was a study by MacDonald-Wilson, Rogers and Massaro (2003) that tested the hypothesis that specific

functional limitations are associated with specific job accommodations.

Bolton, Bellini, and Brookings (2000) based their analysis on a research sample of 4,603 clients in the Arkansas Rehabilitation Service from June 1992 through September 1997. This sample consisted of clients of a rehabilitation program with various disabilities in Arkansas 25 years ago. Employment outcomes were based upon two criteria: (1) whether the person was working in competitive employment and (2) weekly salary of the person if employed. One of the results of the study was that (Bolton, Bellini, and Brookings 2000, 16), "functional limitations were generally unimportant in predicting employment..." However, it is not obvious that a study done of a sample that was based upon clients in an Arkansas rehabilitation program with various disabilities and, most importantly, counted as employed a person who worked as little as 60 days would support the conclusion that limitations have little impact on employment.

MacDonald-Wilson, Rogers, and Massaro (2003) based their analysis on a sample that consisted of 191 employees working in supported employment programs, which consisted of part-time, unskilled jobs. All had various types of psychiatric disabilities. Some 23% of the participants had substance abuse problems and most (87%) reported taking psychotropic medicines. The hypothesis tested was whether certain functional limitations would be associated with specific job accommodations. What the authors found was that workers who suffered from a greater number of functional limitations had a greater number of employment accommodations provided, such as supervisor training and oversight. This, of course, is not surprising since the greater the number of limitations, the more assistance the person will need. Although perhaps useful in order to better implement employment programs for individuals with psychiatric disabilities, it is doubtful whether any of the conclusions support arguments made by VEI concerning heterogeneity. All suffered from psychiatric disabilities, and all were employed in low wage, part-time jobs in programs run by vocational rehabilitation agencies. The biggest issue, though, was that the study did not even focus on employment since all the participants were already employed.

The key argument made by Gamboa and Gibson in the 2015 edition GGWT was that the entries in the Tables are just averages and it is up to the expert preparing an earnings loss analysis to adjust for a specific plaintiff if that is required. Based on that logic, the tables represent the mean values of a distribution that may represent a variety of outcomes. The expert will make the adjustment to a specific plaintiff based on their experience and expertise. But this argument holds only if the tables accurately represent the population of disabled

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individuals, which is not the case. It is difficult to imagine what it means to say that someone is an "average" disabled person. How many persons in that average are paraplegics and how many are blind? Is a paraplegic more disabled or less disabled than a blind person? How do you average a person with a herniated disc with a person with blindness in one eye and another person with AIDS?

VII. Legal Decisions Regarding the Gamboa-Gibson Worklife Tables and Methods

Chapter V of the 2015 GGWT is entitled "Use and Misuse of the Tables." It discusses ten legal decisions, only two of which were reached after the Ireland (2009a, 2009b) papers. Those two were *Knitowski v. Gundy* (2011) and *Anderson v. Rogers* (2012). In *Knitowski*, Anthony Gamboa was permitted to testify about the allegedly reduced worklife expectancy of the plaintiff in a New Jersey superior court. In *Anderson*, GGWT describes the trial court and Court of Appeals of Louisiana as having allowed "testimony based on a reduced worklife expectancy" (page 34), and the denial of an appeal to the Louisiana Supreme Court, but no other details were provided. There is a distinction, however, between the GGWT themselves being used in testimony and employees of VEI, Inc., using some of same methods that were used to produce the tables. Tables in GGWT provide specific values for worklife expectancy while employees of VEI, Inc., use a more complex approach that yields a worklife expectancies based on survival and worklife probabilities specific to individual plaintiffs. [See Ireland and Slesnick (2020) for a discussion of the methods used by VEI employees.]

Prior to 2009, there had been several decisions rejecting experts who were not employed by VEI, but who had used table values from earlier versions of the GGWT. Samples of those decisions were also provided on page 34 of GGWT and are referred to as cases involving "experts who used the tables inappropriately." In 2017 and 2018, a series of four federal decisions excluded testimony based upon GGWT. The first of those cases was *Lackey v. Robert Bosch Tool Corporation* (2017) in which Lawrence Lynch, an economic expert, was not permitted to testify based on tables from GGWT. That decision was cited in *Noel v. Inland Dredging Company* (2018), in which vocational expert Glenn Hebert was not permitted to testify based on the GGWT. Both of those decisions were cited in *Luwisch v. American Marine Corporation* (2018), in which both vocational expert Glenn Hebert and economic expert G. Randolph Rice were not permitted to testify based on the GGWT but were permitted to testify based on standard

worklife expectancy tables. In *Toor v. Homegoods, Inc.* (2018), Anthony Gamboa was not permitted to testify based on methods used to construct the tables, but did not use the tables himself.

In *Stevenson v. S&S Partnership* (2014), an eight-day *Frye-Reed* Hearing (based on *Reed v. State* 1978) was held from January 13-21, 2014 with a focus on whether Michael A. Conte's use of the Gamboa-Gibson tables represented an acceptable basis for Conte's assumed reduction of worklife expectancy of the plaintiff in a lead-paint case. During that week, Michael Brookshire, Gary Skoog, and Frank Slesnick, forensic economists, testified for the defense and Michael Conte and David Gibson testified for the plaintiff. After eight days of the hearing, Judge Stephen Sfekas held that the Gamboa-Gibson tables (then the 2010 edition) were not generally accepted, and that Michael Conte could not rely upon those tables in his testimony.

Employees of VEI have been permitted to testify based on methods used to construct the tables in GGWT in *Figurski v. Trinity Health-Michigan* (2015), *Neupauer v. United States* (2017), *Bennett v. United States* (2018), *Haines v. Get Air LLC* (2019), and *Ortega v. City of L.A.* (2019). Former VEI employee Joseph Crouse, using the same methods as Gamboa and Gibson, was also permitted to testify in *Taherian v. Finast Acquisition* (2020). This list is not exhaustive.

Many of the legal decisions in this section are presented in greater detail in Ireland and Slesnick (2018).

VIII.   Conclusions

The purpose of this paper is to update the conclusions of the papers written in 2009 by Thomas R. Ireland, which evaluated the merits of the 2006 edition of the Gamboa and Gibson's *Worklife Expectancy Tables*. Since that time, the company authoring the Tables, Vocational Economics, Inc. (VEI), has published two other editions in 2010 and 2015. The recent editions of the Tables utilize more recent data and have primarily changed their data source from the Current Population Survey (CPS) to the American Community Survey (ACS). VEI has also responded to some of the many criticisms of the Tables in both the Tables themselves and in articles and papers authored primarily by employees of the company. Further, there have been subsequent rulings in various court venues where the reliability and validity of the Tables have been evaluated.

Since 2009, there has been little or no change in the methodology employed by VEI, though as noted above there have been changes in the source of the data utilized. The fact that the data source has been changed from the CPS to the ACS does not invalidate any of the

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original criticisms. There have also been significant new developments, which further raise doubts concerning the Gamboa-Gibson Tables. The most important is the article written by Krueger and Skoog (2015), which showed that a person who is disabled in the current year does not mean that person will be disabled the rest of his or her potential worklife. Without the assumption that being disabled today means disabled tomorrow, the Tables are meaningless.

Another recent development was the article by Brookshire and Forlines (2014), which prompted a dialogue between those two authors and several employees of VEI, Inc. The articles were published in *The Rehabilitation Professional*. Brookshire and Forlines criticized the Tables because they did not adequately differentiate between the supply side of the labor market equation as represented by the participation rate (P) and the demand side of the labor market equation as represented by the employment rate (E). To the extent the decline in PE is caused by supply factors as indicated by the aggregated data, one needs to further examine whether the plaintiff has adequately attempted to mitigate his or her decline in income due to the disability.

There are several other related issues examined in the paper. Section VI examines the responses made by VEI to criticisms of the Tables. VEI has, in fact, attempted to respond to most of the criticisms but as pointed out in that section, the effort has, in the opinion of the authors of this paper, been unsuccessful. It should also be noted that there has been virtually no response made to the findings of Krueger and Skoog (2015) concerning the transitory nature of disability. Finally, this paper has provided a summary of important legal decisions related to the validity and reliability of the Gamboa-Gibson Tables. There have been rulings both for and against the Tables. It is uncertain, of course, how future rulings will influence whether the Tables and methods used to produce the tables will survive legal challenges.

Based on the evidence, the past 10 years have not advanced the case for using the Gamboa-Gibson Tables in the courtroom. Nevertheless, they are still part of the methodology as presented by employees of VEI and other individuals who have purchased the Tables. What will happen in the future is unknown. Perhaps the Tables will sink into obscurity or, on the other hand, another paper will have to written in 2025 or 2030.

References

Publications

Bolton, Brian F., James L. Bellini, and Jeffrey B. Brookings. 2000. Predicting Client Employment Outcomes from Personal History, Functional Limitations, and Rehabilitation Services. *Rehabilitation Counseling Bulletin* 44(1): 10-21.

Brookshire, Michael L., and Grayson L. Forlines. 2014. The P Problem and the Estimation of Worklife Expectancy Losses in Personal Injury Cases. *The Rehabilitation Professional* 22(4): 207-16.

Brookshire, Michael L., and William E. Cobb. 1983. The Life-Participation-Employment Approach in Personal Injury and Wrongful Death Cases. *For the Defense* 25(7): 20-25.

Ciecka, James E., E. Donley, an J. Goldman. 2000. A Markov Process Model of Worklife Expectancies by Educational Attainment Based on Labor Market Activity in 1997-98. *Journal of Legal Economics* 10(3): 1-21.

Expectancy Data. 2019. *Full-time Earnings in the United States: 2017 Edition*. Shawnee Mission, KS: Expectancy Data. Annual editions from 2008 through 2017 are also available.

Gamboa, Anthony M., and David S. Gibson. 2006. *Gamboa Gibson Worklife Tables*. Louisville, KY: Vocational Economics.

_____. 2010. *Gamboa Gibson Worklife Tables, Revised 2010*. Portland, Oregon: Trial Guides, LLC.

_____. 2015. *Gamboa Gibson Worklife Tables*. Louisville, KY: Vocational Economics.

Houtenville, Andrew J., David C. Stapleton, Robert R. Weathers, and Richard V. Burkhauser. 2009. *Counting Working-Age People with Disabilities*. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Cited in Gamboa and Gibson (2015).

Ireland, Thomas R. 2009a. Why the Gamboa-Gibson Disability Worklife Expectancy Tables Are Without Merit. *Journal of Legal Economics* 15(2): 105-09.

_____. 2009b. Markov Process Work-Life Expectancy Tables, the LPE Method for Measuring Worklife Expectancy, and Why the

Gamboa-Gibson Worklife Expectancy Tables Are Without Merit. *The Rehabilitation Professional* 17(3): 111-26.

Ireland, Thomas R., and Frank Slesnick. 2018. Legal Decisions Regarding Worklife Expectancy in Personal Injury Analysis: Do Economists and Vocational Experts Have Anything to Offer? *The Rehabilitation Professional* 26(2): 65-80.

_____. 2020. Understanding a Vocational Economics, Inc., Calculation of Lost Earning Capacity in a Personal Injury Case with Residual Capacity. *The Rehabilitation Professional* 28(3): 141-50.

Kromer, Braedyn K., and David J. Howard. 2011. Comparison of ACS and CPS Data on Employment Status. Working paper of the Bureau of the Census. Available: https://www.census.gov/library/working-papers/2011/demo/SEHSD-WP2011-31.html.

Krueger, Kurt V., and Gary R. Skoog. 2015. Transitions into and out of Census Disability. *Journal of Forensic Economics* 26(1): 17-51.

MacDonald-Wilson, Kim L., Sally Rogers, and Joseph Massaro. 2003. Identifying Relationships between Functional Limitations, Job Accommodations, and Demographic Characteristics of Person with Disabilities. *Journal of Vocational Rehabilitation* 18: 15-24.

Millimet, D.L., M. Nieswiadomy, H. Ryu, and D. Slottje. 2003. Estimating Worklife Expectancy: An Econometric Approach. *Journal of Econometrics* 113: 83-113.

Paulk, William T. 2007. Mitigation Through Employment in Personal Injury Cases: The Application of the "Reasonable" Standard and the Wealth Effects of Remedies. *Alabama Law Review* 58(3): 647-64.

Skoog, Gary R., James E. Ciecka, and Kurt V. Krueger. 2011. The Markov Process Model of Labor Force Activity: Extended Tables of Central Tendency, Shape, Percentile Points, and Bootstrap Standard Errors. *Journal of Forensic Economics* 22(2): 165-229.

_____. 2019. The Markov Process Model of Labor Force Activity: Extended Tables of Central Tendency, Shape, Percentile Points, and Bootstrap Standard Errors. *Journal of Forensic Economics* 28(1): 15-108.

Smith, Shirley J. 1986. *Worklife Estimates: Effects of Race and Education*. Bulletin 2254, Bureau of Labor Statistics, U.S. Department of Labor (February).

Weed, Roger O., and Timothy F. Field. 2012. *Rehabilitation Consultant's Handbook, 4th edition.* Athens, GA: Elliot & Fitzpatrick, Inc.

Legal Decisions

Anderson v. Rogers, 98 So. 3d 861 (LA 2012)

Bennett v. United States, 2018 U.S. Dist. LEXIS 226328; 2018 WL 6265092 (C.D. CA 2018).

Daubert v. Merrell Dow Pharmaceuticals Inc., 509 U.S. 579; 113 S. Ct. 2786; 125 L.Ed.469 (1993).

Figurski v. Trinity Health-Michigan, 2015 Mich. App. LEXIS 452 (MI 2015).

Frye v. United States, 293 F. 1013 (D.C. Cir. 1923).

Haines v. Get Air LLC, 2019 U.S. Dist. LEXIS 128438 (D. AZ 2019).

Jones & Laughlin Steel Corp. v. Pfeifer, 462 U.S. 532 (1983)

Knitowski v. Gundy, 2011 N. J. Super. Unpub. LEXIS 2797 (N.J. Super. 2011).

Lackey v. Robert Bosch Tool Corporation, 2017 U.S. Dist. LEXIS 4956; 102 Fed. R. Evid. Serv. (Callaghan) 396 (E.D. KY 2017).

Luwisch v. American Marine Corporation, 2018 U.S. Dist. LEXIS 101371; 2018 AMC 1690; 2018 WL 3019019 (E.D. LA 2018).

Neupauer v. United States, 2017 U.S. Dist. LEXIS 203393 (M.D. PA 2017).

Noel v. Inland Dredging Company, LLC, 2018 U.S. Dist. LEXIS 67768; 2018 AMC 2105; 2018 WL 1911821 (E.D. LA 2018).

Ortega v. City of L.A., 2019 U.S. Dist. LEXIS 136650 (C.D. CA 2019)

O'Shea v. Riverway Towing, 667 F. 2d 1194 (7th Cir. 1982)

Reed v. State, 391 A.2d 364, 372 (Md. 1978)

Stevenson v. S&S Partnership, Case No. 24-C-11-008722, Circuit Court for Baltimore, Maryland (2014)

Taherian v. Finast Acquisition, LLC, 2020 Conn. Super LEXIS 255 (CT Super. 2020)

Toor v. Homegoods, Inc., 2018 U.S. Dist. LEXIS 24901 (D. NJ 2018).

Reviews and Cases of Note

Book Review: Measuring Business Interruption Losses and Other Commercial Damages

Jennifer L. Polhemus

Measuring Business Interruption Losses and Other Commercial Damages, An Economic Approach, Third Edition
Patrick A. Gaughan, John Wiley & Sons, Inc., 2020, 544 pages.
ISBN 978-1119647911, $160 print, $96 e-book.

This volume, an update of the 2009 second edition, delves into the expected segments of the expansive lost profits universe, including legal principles, revenue and cost projection, present value discounting, business valuation, and the particularities of intellectual property, securities, and antitrust damages. Note that although "business interruption" can sometimes mean specifically those insurance claims under loss of business income and extra expense policy provisions, this book's title uses "business interruption" more broadly, as occurring anytime an event interferes with business performance and a claim or lawsuit ensues.

Lost profits treatises are typically collections with multiple authors, but here the author handles all chapters himself, and his knowledge and experience are evident. Gaughan is a professor of economics and finance, a seasoned expert witness, and one who has written extensively on lost profits and corporate finance for many years. His textbook *Mergers, Acquisitions and Corporate Restructurings* (Gaughan 2017) is in its seventh edition. He co-edited two volumes concerning forensic economics in the Contemporary Studies in Economic and Financial Analysis series (Gaughan and Thornton 1993 and 2005) and authored the module on commercial damages in *Expert Economic Testimony: Reference Guides for Judges and Attorneys* (Gaughan 1998). The particular text reviewed here is the most recent in a line beginning with Gaughan's *Measuring Commercial Damages* (2000) followed by two editions titled *Measuring Business Interruption Losses and Other Commercial Damages* (2004 and 2009).

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Multiple challenges appear when writing a book like this. The topic itself is unwieldy. The body of relevant case law increases continually. The damages quantification process is so dependent upon the context of the dispute and the specific entity under analysis that it is difficult to present conclusions sufficiently universal to be of real benefit to readers. As Gaughan states: "business interruption loss analysis tends to exhibit more variability than that of [personal injury and employment lawsuits]. . . .The circumstances often vary more widely from case to case" (2020 p. 4). Since he acknowledges that "with many decisions in business interruption loss analysis, the answer is dependent on the case" (p. 153), his aim is to present a systematic general framework for "methodological due diligence" (p. 144) that can be applied widely, and he succeeds.[1] Even when his examples feature large enterprises, which they frequently do, the general analytical structure that he lays out can be applied to smaller firms.

Another challenge for this book is its multiple audiences, including economists, accountants, and other financial experts, with forensic experience and without, and also attorneys who use commercial damages experts.[2] Gaughan manages to accommodate the different needs of these audiences. Presumably for the attorneys, he explains that "macroeconomics is the study of the overall economy" (p. 86) and "interest rates reflect the rate of return that an investor may earn by forgoing consumption until a future time period" (p. 246), while for financial experts he describes how to determine an appropriate profit margin to apply to lost sales revenue.

In this edition, the inclusion of "An Economic Approach" in the title points to a distinguishing feature of this work and its predecessors. In contrast to some other texts expounding lost profits analysis, such as Fannon and Dunitz (2020) and Harry and Kinrich (2017), Gaughan's book places more emphasis on theory and principles of economics and finance, and less on quantification mechanics. Thus, rather than providing detailed instructions for decomposing corporate

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[1] This framework was illustrated effectively using a flowchart in one of Gaughan's earlier works (1998, p. 140) but, alas, not in this book.

[2] The publisher's website also identifies business owners as potential purchasers for this book, saying: "Get ahead of planning for measuring your interruption losses before disaster strikes. . . [because] when the unimaginable happens, are you truly prepared for those business interruption losses?" (John Wiley & Sons 2020). This is an amusing illustration of disconnect between a scholarly work and its marketing team, since business owners hoping to protect themselves from the risk of interruption would be better served by considering risk management strategies, rather than by learning to calculate losses before they occur.

tax returns, or checklists for interviewing company management, this book steps back and stresses the importance of situating lost profits within an analysis of relevant macroeconomic and industry conditions. This is not to say that other books ignore such concerns, but in Gaughan's book they each are given *their own chapter*. Readers can expect a good amount of macroeconomic data and graphs, plus plentiful citations to finance literature.

Forensic economics is a discipline of real-world applications; this book presents the theory and principles which ground the applications, and adds the author's personal observations, including suggestions for how attorneys might counter an opposing expert's faulty work. Gaughan's decades of experience mean that he has a rich mosaic of lost profits examples to weave into the chapters, which newer financial experts will find helpful and even longtime experts may appreciate.

Gaughan knows that users will seek the portions pertaining to particular questions or issues, and likely will not read the text sequentially, so he explains that some material is repeated where it will enhance comprehension. As strong as the content is, the book's organizational design can be frustrating to navigate. Some of the formatting is counterintuitive, since the lowest level sub-headings appear in all capitals. This reader longed for multi-level outlines to begin each chapter, but was grateful for case law citations set aside as footnotes and in their most accessible location, at the bottom of each page! One advantage of updating a book is the opportunity to correct the editing errors which are inevitable in a 500-page volume. Unfortunately, some typographical mishaps carried over from 2009, and more precise copy editing would be welcome (e.g., Table 10.1, titled "Stock Price Performance" for "Winners Corporation," is about neither of those things).

A key question for owners of this book's earlier versions will be: "How significant are the changes incorporated in this new edition?" A full table of contents is available on the publisher's website (John Wiley & Sons 2020). Unsurprisingly, the publisher over-promises a bit, saying that this edition features "updated data, case studies, and case law references" (John Wiley & Sons 2020). Yes, virtually all the tables do have updated data and time periods, but some case studies from the second edition have been omitted. Many chapters contain no new, recent case law; however, this is not a serious failing since synthesizing legal decisions – which often are not precedential across jurisdictions anyway – is not a core purpose of this book.

In my opinion, forensic economists working on commercial damages assignments should have this treatise in their professional library. Although the dust jacket's promotional claim, that this volume is "the only book that explains the methodology for measuring lost

profits in litigation" is inaccurate, it does an excellent job of covering some vast territory. Due to its emphasis on *economic theory*, Gaughan's book can be used in conjunction with other compendiums concerning commercial damages, such as Harry and Kinrich (2017), Fannon and Dunitz (2020), and the *Litigation Services Handbook* series (Weil, Lentz, and Evans 2017). For those who already hold a copy of the second edition, this updated version may not be required, although for practitioners interested in the domains of intellectual property, securities law, antitrust, or punitive damages, the applicable chapters in the latest edition have an abundance of new content and additional references.

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References

Fannon, Nancy J., and Jonathan M. Dunitz, eds. 2020. *The Comprehensive Guide to Economic Damages*, 6th ed. Portland, OR: Business Valuation Resources.

Gaughan, Patrick A. 1998. Reference Guide for Measuring Commercial Damages. In *Expert Economic Testimony: Reference Guides for Judges and Attorneys*. Thomas R. Ireland, Stephen M. Horner, James D. Rodgers, Patrick A. Gaughan, Robert R. Trout, and Michael J. Piette, 108-54. Tucson: Lawyers & Judges Publishing.

_____. 2000. *Measuring Commercial Damages*. Hoboken, NJ: John Wiley & Sons.

_____. 2004. *Measuring Business Interruption Losses and Other Commercial Damages*. Hoboken, NJ: John Wiley & Sons.

_____. 2009. *Measuring Business Interruption Losses and Other Commercial Damages,* 2nd ed. Hoboken, NJ: John Wiley & Sons.

_____. 2017. *Mergers, Acquisitions and Corporate Restructurings,* 7th ed. Hoboken, NJ: John Wiley & Sons.

_____. 2020. *Measuring Business Interruption Losses and Other Commercial Damages, An Economic Approach,* 3rd ed. Hoboken, NJ: John Wiley & Sons.

Gaughan, Patrick A., and Robert J. Thornton, eds. 2005. *Developments in Litigation Economics*. Contemporary Studies in Economic and Financial Analysis, vol. 87. Bingley, UK: Emerald Group.

_____. 1993. *Litigation Economics*. Contemporary Studies in Economic and Financial Analysis, vol. 74. Greenwich, CT: JAI Press.

Harry, Everett P., III, and Jeffrey H. Kinrich. 2017. *Lost Profits Damages: Principles, Methods, and Applications*. Ventnor City, NJ: Valuation Products and Services.

John Wiley & Sons. 2020. *Measuring Business Interruption Losses and Other Commercial Damages, An Economic Approach,* 3rd ed. https://www.wiley.com/en-us/Measuring+Business+Interruption+Losses+and+Other+Commercial+Damages%3A+An+Economic+Approach%2C+3rd+Edition-p-9781119647911

Weil, Roman L., Daniel G. Lentz, and Elizabeth A. Evans. 2017. *Litigation Services Handbook: The Role of the Financial Expert*, 6th ed. New York: John Wiley & Sons.

Why the Forensic Economic Valuation of Nighttime Protection and Care Services Has No Merit

N. C. Ostrofe

Abstract: *This paper critiques "Estimating the Full Value of Household Services Damages: Inclusion of Nighttime Protection and Care Services," by James A. Mills and Bernard Pettingill, published in The Earnings Analyst in 2019. It refutes the idea that there is a third category of household services – Nighttime and Protection and Care services – purportedly undiscovered or overlooked by forensic economists. Mills and Pettingill misinterpret the Dollar Value of a Day:2019 Dollar Valuation and draw specious comparisons with firefighters, security guards, and home health care workers in their attempt to impute economic value to time spent sleeping.*

I.   Introduction

In their recent paper discussing nighttime protection and care services, James Mills and Bernard Pettingill (2019, henceforth herein MP) include two categories of household services conventionally included by forensic economists and valued in *The Dollar Value of a Day: 2019 Dollar Valuation* (Expectancy Data 2020, henceforth herein DVD 19): "Household Production Services" and, to a lesser degree, "Caring and Helping Services." They then introduce a third category ostensibly overlooked by forensic practitioners: "Nighttime Protection and Care Services." Why "Nighttime Protection and Care Services" might have been overlooked by damages experts other than the authors is not addressed. Perhaps the most obvious reason is that "Nighttime Protective Services" appears in the DVD as time spent "Sleeping." The "Sleeping" activity is found within the Personal Time category – time ATUS survey respondents spend that is not coded for where or with whom the activity was conducted.

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It is frequently said that we spend a third of our lives sleeping. Indeed, "Sleeping" in DVD 19 occupies approximately 55 to 65 hours of the 168 hours in a week and is valued at $15.19 per hour in 2019 dollars. Assuming 57 hours spent in sleep at $15.19 per hour amounts to $866 per week, or about $45,000 per year in household services, the amount is more than many plaintiffs earn during their waking hours. Valued at $45,000 per year, the undiscounted value of time spent sleeping over a 25-year period amounts to $1,125,000. Offering an opinion on a category of household service that may increase a plaintiff's award by a million dollars requires careful scrutiny, particularly for a service that is performed while the plaintiff or decedent is unconscious. According to Mills and Pettingill, sleeping is a compensable economic activity.

II.   Sleeping as "On Call" Time

Time spent sleeping is treated as "on call" time, wherein the sleeper stands ready to respond to a household emergency, say, an intruder or a sick child. In this way, the authors contend, sleepers may be compared to firefighters, security guards, or home health aides (MP, 82):

> Household services can be provided to both adults and children. When a child wakes in the night, when an adult has a medical emergency, when there are suspicious noises in or around the home, these are all times when someone must respond. A person who is asleep in the home is immediately available to respond, on an on-call basis, to these events.

The authors acknowledge that they do not know precisely when or how often a suitable emergency may arise that would warrant the need for Nighttime Protective Services (MP, 82): "They may be at the beginning of the night, or in the middle. They may not occur every night." Because the authors believe this is unknowable, they value *all* hours spent sleeping (MP, 82):

> If we knew with certainty when and for how long these events would occur, then we could account for only that time. Since we do not know, and it is in fact not knowable, we include all sleeping time because that is when the services are available.

However, DVD 19 does, in fact, quantify the time individuals spend responding to the events described as warranting Nighttime Protective Services (MP, 82): "When a child wakes in the night, when an adult has

a medical emergency, when there are suspicious noises in or around the home, these are all times when someone must respond."

III. Nighttime Protective Services Are Accounted for in Other Categories of the Dollar Value of a Day

Time spent responding to emergencies is not accounted for in the "Sleeping" activity, however, but in the "Private, Personal, or N/A" activity, or within the Household Production or Caring and Helping Services categories of DVD 19.

Given that nighttime emergencies do not happen every night, the amount of time per day spent in these activities is significantly less than the time spent sleeping. For example, the "Private, Personal, or N/A" category generally only accounts for about 1 – 2 hours per week, rather than the 50+ hours spent sleeping. It also includes numerous other activities, as diverse as: "being searched at a security checkpoint," "having sex," "waiting for the pizza delivery person," and "reading ads on Internet" (DVD 19, Table 402). It is compensated at $17.01 per hour, based upon wages for "Personal Care and Service Occupations." The $17.01 per hour for 1.75 hours per week at 52 weeks per year amounts to about $1,548 per year, or approximately $38,700 over a 25-year loss period (undiscounted). This makes it a far less valuable activity to compensate, even though within this category one finds the sorts of activities that responding to nighttime emergencies would supposedly involve (DVD 19, Table 402): "helping the police with something;" "meeting with detective;" "obtaining police or fire services;" "talking on phone to police or firefighters;" or "talking to police officer."

Likewise, other activities that are invoked under Nighttime Protective Services appear in other categories of the DVD that are conventionally included when valuing household services. For example, the following services are all included in the "Caring and Helping Household Adults" activity (DVD 19, Table 394): "Putting a household adult to bed;" "providing physical aid to household adult;" "talking to household adults' doctors/nurses;" "providing medical care to household adults;" "obtaining medical care for household adults;" and "waking household adult." And the following services are all included in the "Caring and Helping Household Children" activity (DVD 19, Table 393): "Getting household child ready for bed;" "checking on household child;" "giving household child a bottle;" "helping a household child use the bathroom;" "helping household child brush teeth;" "praying with household child;" "providing medical care to household children;" and "obtaining medical care for

household children." Likewise, the following services appear in the Household Management activity DVD 19, Table 389): "Bolting doors/windows;" "checking locks;" "closing house up;" "household accident;" "household emergency;" "maintaining alarms/security systems;" "maintaining smoke detectors;" and "turning out the lights."

By contrast, the activities that Pettingill and Mills propose to compensate within the "Sleeping" category of household services are (DVD 19, Table 401): "catnapping, counting sheep, dozing, dozing off, dreaming, falling asleep, getting some shut eye, getting up, insomnia, lying awake, napping, sleeping, tossing and turning, and waking up." In fact, the DVD explicitly acknowledges that even secondary services to others cannot be performed during the time spent sleeping (DVD 19, 11): "Sleeping does not allow secondary childcare since the respondent has to be awake to provide secondary childcare."

The contrast between MP and DVD 19 raises an interesting question for those forensic economists who, in wrongful death cases, deduct personal consumption, or "services performed for the benefit of the respondent only," from household production services. "Sleeping" would appear to be an activity performed exclusively for the benefit of the respondent. The ATUS does not track where or with whom respondents sleep, and the DVD does not consider secondary childcare possible while sleeping. As such, in a wrongful death action, the percentage of time spent sleeping for the benefit of the decedent would appear to be 100 percent, and, after deducting personal consumption, there would be no remaining loss of support for the "Sleeping" category.

IV.   Replacement Values for Nighttime Protective Services

Although the DVD has elected to assign the market value of wages for Home Health and Personal Care Aide and Security Guard to the activity of sleeping, assigning such replacement values sharply overstates the value of services provided to household members by a sleeping member of the household.

After a spouse's death, few, if any, widows or widowers hire home health aides or security guards to spend the nocturnal hours with them to replace the deceased spouse. In a Canadian study (Van den Hoonaard 2009), even widows fearful of living alone chose independence over finding a replacement for the deceased spouse and gradually learned to live alone.

There are important differences between the services home health aides or security guards provide and those provided by sleeping household members. According to the *Occupational Outlook*

Handbook (U.S. Bureau of Labor Statistics 2020, at Home Health Aides and Personal Care Aides):

> Home health aides and personal care aides help people with disabilities, chronic illness, or cognitive impairment by assisting in their daily living activities. They often help older adults who need assistance. Home health aides may be able to give a client medication or check the client's vital signs under the direction of a nurse or other healthcare practitioner.
>
> Home health aides and personal care aides typically do the following:
>
> - Assist clients in their daily personal tasks, such as bathing or dressing
> - Housekeeping, such as laundry, washing dishes, and vacuuming
> - Help to organize a client's schedule and plan appointments
> - Arrange transportation to doctors' offices or other outings
> - Shop for groceries and prepare meals to meet a client's dietary specifications
> - Keep clients engaged in their social networks and communities

Also, quoting elsewhere from the *Occupational Outlook Handbook* (U.S. Bureau of Labor Statistics 2020, at Security Guards and Gaming Surveillance Officers):

> Security guards and gaming surveillance officers patrol and protect property against theft, vandalism, and other illegal activity.
>
> Security guards and gaming surveillance officers typically do the following:
>
> - Enforce laws and protect an employer's property
> - Monitor alarms and closed-circuit TV (CCTV) cameras
> - Respond to emergencies
> - Control building access for employees and visitors
> - Conduct security checks over a specified area
> - Write reports on what they observed while on duty
> - Detain violators
>
> Guards and officers must remain alert, looking out for anything unusual. In an emergency, they are required to call for assistance from police, fire, or ambulance services. Some security guards are armed.

Notably, none of the job activities of a Home Health Aide or a Security Guard include any of the activities included in "Sleeping." To

be sure, Home Health Aides may work 24-hour shifts, for which they are paid a per diem rate, but this is generally in situations wherein a household individual has a medical requirement for 24-hour care and/or monitoring. It is only in these specific situations, wherein nighttime supervision of the surviving spouse is required by a physician, that Expectancy Data (publisher of DVD) intended for time spent sleeping to be valued as a compensable service (DVD 19, 1 [*emphasis added*]):

> When we sleep, we provide value for our household in the form of protection, care, and comfort – how many wives sleep less comfortably when their husbands are away from home on business? What is the value to the timid when the bravest household member checks out noises in the night or the care that is available to the sick? Obviously, guards and nurses provide protection and care services for sleeping persons and their wage rate would be a reasonable place to begin to price such service activity, *if required*.

Nighttime services, indeed on-call round-the-clock services, are provided by firefighters, and a discussion of these professionals based on Karannis (2014) and Sweigard (2017) is instructive. Firefighters are paid to be on 24-hour call, at the firehouse, if needed immediately. They are compensated for being on call and at work, whether awake or asleep, and for their expertise and training in emergency medical response and fighting fires. As it happens, firefighters are *not* paid to sleep. Firefighters work longer shifts – 48 hours per week – at 24 hours on shift, 48 hours off shift, to allow cities to hire fewer firefighters and thus save money. Firefighters also work longer shifts because 8-hour shifts are impractical when battling fires or responding to disasters. Firefighters are required to respond immediately to emergencies as a team, necessitating that, while in on-call status, they live at the firehouse. They are responsible for responding to emergencies in the greater community, not their immediate household. Because they are responsible for responding to the greater community, it is far more likely that they will be called to active duty within a 24-hour shift. The ratio of firefighters to the general population in the United States is 167 firefighters per population of 100,000, making each firefighter responsible for responding to approximately 600 people per night, not a household of 3.

V.   Counterarguments to Arguments Against Valuing Nighttime Protective Services

Perhaps because Mills and Pettingill recognize that, once finders of fact discern that they are being asked to compensate the plaintiff for

time spent sleeping, they or opposing counsel might raise objections, the authors attempt to anticipate such objections and address them.

You want to pay someone to sleep.

Here, the authors sidestep the fact that the plaintiff or survivors of the decedent are, in fact, being compensated for time the plaintiff or decedent spent sleeping, or that they cannot perform services for the benefit of others while asleep. Instead, the authors merely comment (MP, 83):

> The inclusion of nighttime protection and care service values are an empirical and statistical measure of what the decedent was able to do prior to the litigated incident. As with all elements of damages, it is within the purview of the jury to decide what the ultimate value of each element of damages is. They will have to determine if these are services that were provided by the decedent, and if the plaintiffs should recover them.

The authors also compare sleeping plaintiffs and decedents to firefighters (MP, 83):

> There are numerous municipalities in the United States wherein firefighters work 24 hours [sic] shifts. At night, between calls, they sleep. They are available on an immediate, on-call basis to respond to emergencies. They are not being paid to sleep; they are being paid to be immediately available to respond to the needs of the community.

This paper has previously addressed the distinctions between sleeping plaintiffs or decedents and firefighters on duty.

Are you saying the family is going to go out and hire security guards?

As aforementioned, plaintiffs or surviving spouses seldom hire replacement services in the form of security guards or home health aides, except when a surviving household member has a medical requirement for round-the-clock monitoring that was originally performed by the plaintiff or decedent. In that situation, if the plaintiff or decedent was responsible for monitoring that household member, it would be appropriate to compensate for the time spent in this activity. In households where there are no household members requiring 24/7 monitoring, there would be no need for the plaintiff or decedent to be "on call," and the time s/he spent sleeping would presumably not be missed or replaced. Again, the authors sidestep this argument, commenting only (MP, 84):

> The lack of out-of-pocket expenditures by survivors is not evidence that a loss of household services was not suffered … The dollar value in a day is representative of value, not the determinant of value. Some people value an activity while others do not …

> The *Dollar Value of a Day* does not address whether a person would ever want or need to hire someone to perform or assist with any or all their activities.

It must be remembered that the DVD is not an authoritative source on the valuation of household services. Expectancy Data adopted the American Time Use Study conducted by the Bureau of Labor Statistics and assigned wage values to various groupings of activities. Expectancy Data's opinion that wages for Home Health Aides and Security Guards are appropriate proxies for the value of time spent sleeping is just that, an opinion. And, while the DVD is frequently used as a source for valuing household services within the forensic economic community, many forensic economists do not rely upon it or embrace it in its entirety.

> *Wouldn't you be overcompensating the plaintiff(s), since the injured or deceased person wasn't a professional home health aide or security guard?*

This question seems disingenuous since it implicitly assumes that time spent sleeping should be compensated at the wage rate paid to a conscious working professional. It also implies that home health aides and security guards are more talented at sleeping than their lay counterparts. Yet the authors merely contend that the wage rates given for various activities in the DVD are not necessarily overvalued (although they apply wage rates for professionals who engage in the valued activity rather than lay people or amateurs) and, in fact, are likely undervalued because the plaintiff or the decedent would have cared more for their family than strangers would have. The authors contend (MP, 84):

> There are no requirements for any of the categories of the DVD to match the wage levels for replacement services to the actual education, training, and experience of the person whose services are being replaced. As an example, there is no requirement that the injured or deceased person be a professional chef to include the replacement wages of someone to prepare meals. Further, it is probable that the wages of a home health aide or security guard undervalue the loss. This is because the decedent would likely

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have cared far more for their family members than would a stranger.

Suggesting that the plaintiff or decedent's labor would be worth more than a professional's, because plaintiff or decedent would have cared more for family members than a stranger would have, blurs the legal distinction between economic or special damages and non-economic or general damages (e.g., care, comfort, and society). While the sentiment is moving, it overlooks the fact that workers in commercial employment do not work under the same conditions found in household labor. Commercial laborers must ensure their work is of sufficient quality as to remain competitive in the marketplace: those who purchase their services can easily switch providers. Children and co-habitants do not select household labor providers in a competitive marketplace and generally must accept the labor provided, regardless of its quality. A measure of the relative value placed upon services provided by a household member and those provided by a professional is the eagerness of many families to eat out when they can afford to do so. And one advantage of hired workers is, unlike spouses or household members, they do not need to be motivated to perform their work.

Nighttime protection and care would be part of care, comfort, and consortium. It is not an economic damage.

The California Civil Jury Instructions (henceforth, CACI) 3920 - Loss of Consortium (Noneconomic Damage) refer to the:

loss of [his/her] [husband/wife]'s companionship and *services*, including:

1. The loss of love, companionship, comfort, care, assistance, protection, affection, society, moral support; and
2. The loss of the enjoyment of sexual relations [or the ability to have children].

Here, although the language of CACI 3920 is clear, referring to services, including care, assistance, and protection, the authors argue (MP, 84):

This is NOT the non-economic value of care or comfort, etc. This is the economic value of the physical service; of the decedent being available on an immediate basis to provide such services. If a child is sick, the care rendered by a parent may bring comfort, but the parent is providing a service that brings about that result. No one questions the notion of caring for family members during the

waking hours. Why would it be questioned during the sleeping hours?

Here, the authors wonder why caring for family members would be questioned during the sleeping hours. Simply put, caring for family members during the sleeping hours *is* questionable because if one is sleeping one cannot, by definition, care for others, as stated in the following passage (DVD 19, 11): "Sleeping does not allow secondary childcare since the respondent has to be awake to provide secondary childcare."

> *Nighttime protection and care aren't proper and shouldn't be included in a household services estimate.*

Here the authors contend that what constitutes "household services" is not precisely defined in the California or Nevada Civil Jury Instructions. Regarding California:

> CACI 3903E. Loss of Ability to Provide Household Services (Economic Damage)

> [*Insert number, e.g.,* "5."] The loss of [*name of plaintiff*]'s ability to provide household services. To recover damages for the loss of the ability to provide household services, [*name of plaintiff*] must prove the reasonable value of the services [he/she] would have been reasonably certain to provide to [his/her] household if the injury had not occurred.

And according to Nevada Jury Instructions – Civil: "Also, include the reasonable value of services performed by another in doing things for the plaintiff, which, except for the injury, plaintiff would ordinarily have performed."

Both the California and Nevada jury instructions presume that a service was provided by the plaintiff or decedent. As this article has demonstrated, and the DVD indicates, no service can be performed while a plaintiff or decedent is sleeping because the plaintiff or decedent must be awake to perform a service. Because, by definition, a plaintiff or decedent cannot perform a service while sleeping, the category of Nighttime Protection and Care Services *is* improper and should not be included in a claim for lost household services.

VI.   Conclusion

Mills and Pettingill conclude that the category of Nighttime Protection and Care Services is a valid component of household

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services that can be estimated using the DVD and which has been admitted by judges and awarded by juries in and out of California. The authors also believe further research should be conducted into the valuation of the services since services are not provided all night long or every night, perhaps a ratio of less than 100 percent should be utilized. What this means is not clear – less than 100 percent of the allotted time, less than 100 percent of the stated rate, or both?

As this paper has demonstrated, time spent sleeping is time during which no service can be provided. The protection and care services invoked by the authors do not occur within the "Sleeping" activity of the DVD, but elsewhere, frequently in the Household Production or Caring and Helping service categories already conventionally used by forensic economists. Compensating time spent sleeping is either nonsensical or double counting. Valuation of Nighttime Protection and Care Services has no merit.

References

Expectancy Data. 2020. *The Dollar Value of a Day: 2019 Dollar Valuation*. Shawnee Mission, KS: Expectancy Data.

Judicial Council of California Civil Jury Instructions (2021 edition). Available: https://www.courts.ca.gov/partners/documents/Judicial_Council_of_California_Civil_Jury_Instructions.pdf

Karannis, George. 2014. Dissecting ISO 37120: Firefighters and Emergency Response Indicators – How Safe Is Your City? Smart Cities Council (August 20). [Last visited 7/6/20.] Available: https://smartcitiescouncil.com/article/dissecting-iso-37120-fire-and-emergency-response-indicators-how-safe-your-city

Mills, James A., and Bernard F. Pettingill. 2019. Estimating the Full Value of Household Services Damages: Inclusion of Nighttime Protection and Care Services. *The Earnings Analyst*, Vol. 16: pp. 81–86.

Nevada Jury Instructions: Civil (2018 edition). Available: https://nvbar.org/nevada-jury-instructions-2nd-ed-cover-8x11-v2/

Sweigart, Josh. 2017. The I-Team Asks: Are Firefighters Getting Paid to Sleep? The Dayton Daily News (September 21). [Last visited 7/6/20.] Available: https://www.daytondailynews.com/news/the-team-asks-are-firefighters-getting-paid-sleep/wRA7x5I0DhNN6UXpnel45K/

U.S. Bureau of Labor Statistics. 2020. *Occupational Outlook Handbook*. At Home Health Aides and Personal Care Aides. [Last visited 7/6/2020.] Available: https://www.bls.gov/ooh/healthcare/home-health-aides-and-personal-care-aides.htm#tab-2

U.S. Bureau of Labor Statistics. 2020. *Occupational Outlook Handbook*. Security Guards and Gaming Surveillance Officers. [Last visited 7/6/2020.] Available: https://www.bls.gov/ooh/protective-service/security-guards.htm#tab-2

Van den Hoonaard, Deborah. 2009. Experiences of Living Alone: Widows' and Widowers' Perspectives. *Housing Studies* 24(6): 737–53. Available: https://doi.org/10.1080/02673030903203015

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