STATE OF INDIANA	**)**	**IN THE ST. JOSEPH SUPERIOR COURT**
	)SS:	
ST. JOSEPH COUNTY	**)**	**CAUSE No. 71D06-0305-CT-00116**

DALENO F. ANGLIN and MARGIE ERWIN,	)
Plaintiffs,	)
v.	)
PHYLLIS L. REED,	)
Defendant.	)

Affidavit of David S. Gibson, MBA, CPA

COMES NOW, David S. Gibson, MBA, CPA, being first duly sworn upon his oath states the following:

As president of Vocational Econometrics, Inc., the publisher of *The New Worklife Expectancy Tables* (the Tables), I have been asked by Mr. Franklin D. Julian to offer background information on the validity of the tables and their underlying data. This affidavit centers around the following key areas:

1. Nondisabled Worklife Expectancy
2. Skoog and Toppino Article

After providing a background on how the Tables are derived, each of these points will be discussed.

1. Derivation of the Tables

The Tables were originally developed in 1987 to examine the impact of work disability on the expected number of years of employment for an individual, given his or her age, gender, and level of education. Expected years of employment over a person's remaining life expectancy has been classified by government and forensic economists as "worklife expectancy." The worklife expectancy statistics contained in the Tables are derived using reliable government source data in a peer-reviewed methodology accepted among forensic economists. The definition of work disability used in the Tables, including the definition of severe disability (used in the case at hand), was created and is specifically defined by the Census Bureau.

1.1. Underlying methodology

The method used in developing the worklife expectancies contained in the Tables is known as the Life, Participation, and Employment (LPE) model. This model computes a person's probability of working in any particular year by combining the probability that a person will be alive (L) at each future year with the probabilities he or she will be active in the labor market (P) and employed (E). The individual probabilities for each year are then summed to derive a worklife expectancy.

The LPE method is one of the methods generally accepted among economists for computing worklife expectancies. It was developed by Michael Brookshire and William Cobb (1983) and was further refined by Brookshire, Cobb and Gamboa (1987). In a 1991 article in the *Journal of Legal Economics*, Gary Albrecht applied this methodology to assessments of earnings for partially disabled individuals. In addition, a 1999 publication by Richards and Abele, *Life and Worklife Expectancies*, looks at several generally accepted ways of computing a statistical worklife, including the LPE model used in the Tables. These and other publications dealing with the LPE method can be found in Attachment A.

The methodology is further supported by a 1982 appellate decision, *O'Shea v. Riverway Towing*,[1] which recommended a method of estimating expected earnings that involves probability statistics. After listing Mrs. O'Shea's limitations, the court noted that:

> It seems unlikely that someone in this condition could find gainful work at the minimum wage. True, the probability is not zero; and a better procedure, therefore, might have been to subtract from Mrs. O'Shea's lost future wages as a boat's cook the wages in some other job, discounted (i.e. multiplied) by the probability – very low – that she would in fact be able to get another job.

In commenting on the analysis performed by the economist, Judge Posner notes that:

> No allowance for the fact that Mrs. O'Shea, whose health history quite apart from the accident is not outstanding, might very well not have survived – let alone survived and been working as a boat's cook or in an equivalent job – until the age of 70. The damage award is a sum certain, but the lost future wages to which that award is equated by means of the discount rate are mere probabilities. If the probability of her being employed as a boat's cook full time in 1990 was only 75 percent, for example, then her estimated wages in that year should have been multiplied by .75 to determine the value of the expectation that she lost as a result of the accident; and so with each of the other future years. The economist did not do this and by failing to do this he overstated the loss due to the accident.

In this decision, the court defined a "better procedure" for estimating future expected earnings, that of utilizing probability statistics to better define future expected earnings in assisting the trier of fact. The procedure is identical to the method used in the Tables for estimating worklife expectancy.

[1] 677 F. 2d 1194 (1982)

1.2. Government source data

The probability of life is extracted from the *United States Life Tables* developed by the National Center for Health Statistics.[2] The life tables are published annually and are widely used for determining life expectancy.

The data used to project the probability of employment were developed by the U.S. Census Bureau from its Annual Demographic Survey, as published on the Census Bureau website.[3] The Annual Demographic Survey is conducted by the U.S. Census Bureau as a supplement to its monthly Current Population Survey (CPS). In March of each year since 1981, the CPS has been expanded to collect more information on income and employment. The March supplement to the CPS provides participation and employment rates of persons with and without work disability through expanded questions that specifically address work disability.

The CPS survey is the primary source of employment data for persons in the United States, and the source of the government's monthly unemployment rates that are widely quoted by the media. The CPS is generally accepted as a valid source of data regarding the employment experiences of people with and without a work disability. Section 3.3.2 briefly discusses some of the research conducted that uses the CPS for employment-related disability research (see also Attachment B).

1.3. Definition of disability

The definition of work disability used in the Annual Demographic Survey can be found on the Census Bureau web site.[4] This definition was created and is controlled by the Census Bureau. As part of this definition, the government also created the sub-categories of severe and not severe disability. The Census Bureau defines work disability as existing when a person meets one or more of the following conditions:

[2] http://www.cdc.gov/nchs/products/pubs/pubd/lftbls/life/1966.htm

[3] http://www.census.gov/hhes/www/disable/disabcps.html

[4] http://www.census.gov/hhes/www/disable/cps/cpsworkd.html

CPS Work Disability Criteria
Not Severe
Identified by the March Supplement question "Does anyone in this household have a health problem or disability which prevents them from working or which limits the kind or amount of work they can do?"
Identified by the March Supplement question "Is there anyone in this household who ever retired or left a job for health reasons?"
Received VA disability income in previous year.
Severe
Identified by the core questionnaire as currently not in the labor force because of a disability that is expected to last for at least the next six months.
Identified by the March Supplement as a person who did not work at all in the previous year because of illness or disability.
Under 65 years old and covered by Medicare in previous year.
Under 65 years old and received Supplemental Security Income (SSI) in previous year.

A person who answers "yes" to at least one of the three questions listed under Not Severe, but "no" to all of the last four will be defined as having a nonsevere work disability. Anyone who says "yes" to any of the four questions listed under Severe will be defined as having a severe work disability. These Census Bureau definitions are used in developing the worklife expectancies found in the Tables.

2. Nondisabled Worklife Expectancy

Defense criticizes Dr. Barkhaus' use of the Tables to determine Mr. Anglin's pre-injury, nondisabled worklife expectancy because the Tables are supposedly invalid and unreliable when applied to individuals with disability. Defense's problem with this is illogical, because the 24.7 year worklife expectancy is specifically for those *without* disability, and, therefore, not relevant to their arguments against the disability specific worklife expectancies.

The 24.7 year estimate is reasonable for estimating Mr. Anglin's worklife as a nondisabled individual. A recent article in the *Journal of Legal Economics*[5] provides worklife expectancies using a different methodology than that used in the Tables. The worklife expectancy for a male with a comparable level of education is 22.84 years, close to the estimate in the Tables. This represents the worklife for all men who are active in the labor market, though it includes some who are disabled.

[5] Ciecka, James, Thomas Donley, and Jerry Goldman. "A Markov Process Model of Work-Life Expectancies Based on Labor Market Activity in 1997-98." *Journal of Legal Economics*, Winter 99-00, 33-68.

3. Skoog and Toppino Article

The main focus of Defense's criticisms comes from an article by Skoog and Toppino (S&T) published in the *Journal of Forensic Economics*. This journal, however, is not intended as an authoritative publication. It publishes multiple contrasting opinions and approaches of the forensic community.

Defense fails to mention a subsequent article that was published in the same journal as a response to the S&T article. This article (Gibson and Tierney, 2000, in Attachment C), which responds to all of the issues raised in S&T, underwent the same peer review process as the S&T article. A fuller version of this article is also available (Gibson, 2001, in Attachment C).

In discussing the article, Defense claims that the Tables are invalid and unreliable and mentions several of the issues raised by S&T. While a full response to S&T can be found in the articles mentioned in the previous paragraph, a few issues will be highlighted in the following sections.

3.1. Peer Reviewed Articles

Defense notes that articles have been written that favor the Tables, but dismisses them because they were written by people related in some way to Vocational Economics, Inc. In contrast, they note one article criticizing the Tables that they feel invalidates their use. Their argument, however, is both misleading and incomplete. Defense fails to mention, for instance, that two noted Census Bureau officials (unrelated to Vocational Economics) have supported use of CPS data for studying the effects of disability on work (see Attachments D and E).

By discounting the favorable articles, defense misinterprets the peer review process. The articles alluded to by defense underwent a blind peer review process and were accepted for publication. By definition, this means that others in the profession, also unrelated to Vocational Economics, have found the articles to have scientific merit. The fact that many of these articles are authored by persons associated with Vocational Economics should not be a surprise. After all, the persons most likely to write about a science are the researchers that lead innovations in that science.

The worklife tables and the CPS data underlying them are the subject of multiple articles. The bibliography (see Attachments A and C) is a partial listing of these articles and includes listings of articles pertaining to the worklife tables themselves and to the methodology underlying them. Articles supporting use of CPS data are noted in Attachment B. The bibliographies show that the worklife tables have been reviewed in professional journals and that the CPS data have been used by researchers for both forensic and non-forensic purposes.

3.2. Use of Statistical Averages

In their motion, Defense objects to Dr. Barkhaus' use of the worklife expectancies in the Tables in part because they feel the data "are inappropriate mechanisms for identifying disabled individual or categories of disability" and are invalid when applied to individuals. It is true that the population of those with a work disability is quite diverse. It is incorrect, however, to

surmise that this precludes the use of a statistic drawn from this population. The following sections discuss this issue in more detail.

3.2.1. The uncertain nature of calculations of lost future earnings

What defense seems to want is absolute knowledge of Mr. Anglin's future. This, of course, is not possible for anyone. In the absence of a crystal ball, it is necessary to estimate based on appropriate population statistics that are applied to the facts of Mr. Anglin's case. As Marcia Angell noted in *Science on Trial* (1997, p. 115):

> Courtroom trials are not about populations, they are about individuals. . . . We have no basis, at least in the current state of knowledge, for making a judgment about a particular woman. We therefore must appeal to epidemiological data – that is, studies of populations.

Perhaps defense is frustrated by lack of a scientific formula to precisely predict the future employment of the plaintiff and calculate the resulting earnings impact. Worklife expectancy deals with the future of a human being, something that can never be known with absolute certainty. The U.S. Supreme Court acknowledges this uncertainty in a 1983 decision (*Jones and Laughlin Steel Corporation v. Howard E. Pfeifer,* 462 U.S. 523):

> By its very nature the calculation of an award for lost earnings must be a rough approximation. Because the lost stream can never be predicted with complete confidence, any lump sum represents only a "rough and ready" effort to put the plaintiff in the position he would have been in had he not been injured.

The Court went on to deride attempts at coming up with such statistics:

> We do not suggest that the trial judge should embark on a search for "delusive exactness." It is perfectly obvious that the most detailed inquiry can at best produce an approximate result.

3.2.2. Statistical averages

As noted in the previous section, it is not possible to give a precise number representing a person's future worklife expectancy. Defense is incorrect, however, when they note that this is an automatic rejection of the statistical averages found in the Tables.

The consternation seems to stem from a need for a very precise formula to apply these population statistics to an individual plaintiff. Averages from various populations have long been accepted as a means for prediction – life expectancy, earnings, and others. No statistic, no matter how fine-tuned, can provide an exact predictor of an individual's future. This is as true of worklife expectancies as it is of various measures of annual earnings and growth and discount rates. The expert must use available statistics about populations and mold them to meet the specifics of the case.

Defense objects to the worklife expectancy statistics because they are not specific to particular conditions or types of impairment. In short, they object to the fact that the statistics are derived from an average for males with a work disability and an education level equivalent to Mr. Anglin's. They feel the groups used are too broadly defined. They offer no alternative measures that meet their condition-specific criteria.

Economists, actuaries, insurance companies, and gambling establishments use population averages when making rational bets on human outcomes. The basic belief is that in the absence of more specific and precise information, the best predictors of outcomes are statistical averages or relative frequencies. Following this, disability data do not have to be segregated by type, severity, or duration of disability in order to be reliable or meaningful.

The desire for impairment-specific data on worklife expectancy makes no sense when looked at from a vocational rehabilitation perspective. Many different types of conditions can result in identical work-related impairments (e.g., both a knee injury and a lung ailment can result in a restriction to sedentary work). Also, the same condition may have varying work-related impacts on different people. (An attorney and a construction worker with less than a high school degree would have widely different impacts from the loss of use of a non-dominant arm.) Impairments from non-injury related causes can result in work disability of varying degrees, with minimum to maximum impact. What is relevant is the effect of the impairment, whatever the cause, on a person's capacity to work and earn money.

In the field of statistics and actuarial sciences, probabilities are derived by determining the average of a statistical cohort, that is, the average performance of those persons most like the person being predicted. When predicting the height of a 5-year-old boy, should one use an average of all people or of 5-year-old boys? Similarly, when predicting the employment experience of a male with a severe work disability, should one use an average of all people or of males with a severe work disability? In conducting his analysis, Dr. Barkhaus applied to Mr. Anglin only those statistics that are for people the he determined were similar to Mr. Anglin—pre-injury, for those who are nondisabled, and post-injury, for those who have a severe work disability.

What the criticism does point to, however, is the fact that statistics of all sorts must be used responsibly and applied by persons familiar with the world of work and career development theory. When assessing persons with disability, the user should be familiar with the effects of impairment on ability to work and earn money as well as the experiences of persons with disability in the labor market.

3.3. General Acceptance

In their Motion, Defense implies that the Tables do not have general acceptance in the relevant scientific community and state that they are criticized by government employees.

Forecasting a plaintiff's future earnings stream is not an exact science. "General acceptance" does not require universal or majority usage in the scientific community. There is no single step in the loss computation process that enjoys universal acceptance in the economic community. As such, it is predictable that experts may disagree on the method for computing lost earnings. This is true of defining earning capacity, computing worklife expectancy, projecting earnings growth, and determining discount rates. However, the pursuing discussion will demonstrate that the Tables, their underlying data, and the computational methodology all have substantial (general) acceptance throughout the vocational, economic, and disability research communities.

The worklife tables, as well as the data and methodology underlying them, have been the subject of many articles, lending credence to their overall acceptance (see Attachment C). In addition, Section 1 describes articles pertaining to the LPE methodology used in developing the Tables. The following sections provide support for the CPS data underlying the Tables and discuss the use made by various researchers of the data used to derive worklife expectancy.

3.3.1. General support

The presence of a disability is widely known to affect both earnings and worklife expectancy. This finding is documented in results from various surveys, including the 1990 and 2000 decennial Census, the Current Population Survey (CPS), the American Community Survey,[6] and the Survey of Income and Program Participation (SIPP) from the Census Bureau,[7] the National Health Interview Survey (NHIS) from the National Center for Health Statistics,[8] and the N.O.D./Harris Survey of Americans With Disabilities.[9] The disability effect is the cause of such events as the passage of the well-known Americans with Disabilities Act (ADA),[10] the existence of the Department of Labor's Office of Disability Employment Policy,[11] and the practice of rehabilitation counseling, just to name a few.

For the purpose of developing the Tables, data from the CPS were used. The CPS is the primary source of employment data for persons in the United States, the source of the government's monthly unemployment rates that are widely quoted by the media.

In addition, government and private (nonforensic) researchers use CPS data to study employment patterns of the U.S. population with work disabilities as support for governmental policy decisions (see Attachment B). This includes work funded by the Department of Education, National Institute on Disability and Rehabilitation Research and conducted by researchers at Cornell University. They have published multiple papers using the CPS to study the effects of work disability on earnings and employment.[12]

---

[6] http://www.census.gov/acs/www

[7] Data from the decennial Census, CPS, and SIPP can be found on the Census Bureau website at http://www.census.gov/hhes/www/disability.html

[8] One example is a study by Stapleton, et al. (1997) that accesses data from the NHIS. http://aspe.hhs.gov/daltcp/reports/eshcclit.htm

[9] http://www.nod.org

[10] http://www.usdoj.gov/crt/ada/adahom1.htm

[11] http://www.bls.gov/odep

[12] The Cornell papers can be found at http://www.ilr.cornell.edu/extension/ped/RRTC/papers.html. A related article published by the Federal Reserve Bank of San Francisco can be found at http://www.frbsf.org/econrsrch/wklyltr/2000/el2000-28.html.

Private research (Yelin, 1996; Yelin and Trupin, 1997 see Attachment B; Gibson, 2000 and 2001, see Attachment C) has shown that employed persons with a work disability, both not severe and severe, are more likely to become unemployed than persons without a work disability. If unemployed, they are less likely to find employment. These differences become more profound with age.

Even if persons with a work disability find employment conducive to their disabilities, they face ongoing struggles to cope with their disabilities. These struggles may intensify with age, continuously making it more difficult to compete with their counterparts without disability (Gibson, 2000 and 2001, see Attachment C; also see U.S. Census Bureau website[13]). The impairments will place the individual at a disadvantage in the labor market compared to those without disability, and likely cause the person to have a harder time finding and/or maintaining comparable employment.

3.3.2. Use of the underlying data by disability researchers[14]

Various independent researchers use CPS data in research on the employment experiences of persons with a work disability. In a presentation before the National Association of Forensic Economics (NAFE) in November 2000, John McNeil, a special assistant for disability statistics for the U.S. Census Bureau, now retired, reaffirmed the application of CPS data for the study of persons with a work disability. As part of the presentation, he produced a study entitled "Employment and Earnings of Individuals 18 to 64 by Disability Status: Data from the March 2000 Current Population Survey." The study explores the participation and employment rates for persons with work disability using the same data used in *The New Worklife Expectancy Table*s. In addition, he signed an affidavit (Attachment D) stating he sees no reason why the CPS data for work disability cannot be used in the manner applied by Vocational Econometrics. He also authored an article further supporting use of CPS data for studying worklife issues for people with a work disability (McNeil, 2002).

Herman Miller functioned as the chief of the Population Division of the Census Bureau. He has also signed an affidavit (Attachment E) noting that the CPS data are "the most appropriate source for studying the employment experiences of people with a work disability."

In addition, both government and non-government researchers rely on the CPS employment rates and earnings figures for non-forensic purposes. Burkhauser, Daly, and Houtenville (2000), for example, used data from the March supplement of the CPS to compare the employment experience of people with and without disability during the 1990s business cycle. This paper was published through the Rehabilitation Research and Training Center (RRTC) for Economic Research on Employment Policy for Persons with Disabilities at Cornell University. The Cornell RRTC has also published several other papers using CPS data on persons with a work disability. These include papers by Houtenville (2000) that studied the prevalence, employment rates, and household income of people with disability, as well as a paper by

---

[13] http://www.census.gov/hhes/www/disable/disabcps.html

[14] Unless otherwise noted, all articles described in this section can be found in Attachment B.

Burkhauser, Houtenville, and Wittenburg (2001) that compared the employment trends of persons with work limitations using the CPS and two other government surveys.

Daly, Burkhauser, and Houtenville (2000) published a paper through the Federal Reserve Bank of San Francisco that used CPS data to study the work and income of men with disability. Acemoglu and Angrist (1998), both with the Department of Economics at MIT, published a paper through the National Bureau of Economic Research that used CPS data to study the impact of the ADA on the employment of people with disability.

Researchers at the University of California, San Francisco, also use CPS data to study persons with a disability. This work includes an article published in the U.S. Bureau of Labor Statistics' *Monthly Labor Review* (Yelin and Katz, 1994) that used both the CPS and the National Health Interview Survey to study the participation trends of people with and without disability during the period from 1970 to 1992. Yelin (1996) and Yelin and Trupin (1997) used the CPS to study the participation and employment of people with and without disability during the mid-1990s.

Government researchers have also used CPS data to study the experiences of people with and without work disability. The U.S. Census Bureau measured the participation and employment rates and average earnings of people with and without disability and published the results in two key documents (1983 and 1989). In 2001, the Census Bureau issued a press release that included basic information from the CPS on the prevalence, employment, earnings, and education of people with a work disability.

The research list above is not meant to be complete. It does, however, give an idea of the variety of researchers using CPS data. The use of the CPS by this sampling of government and non-government researchers corroborates the validity of the CPS for the purpose of studying the work experience of people with a work disability. Independent researchers from various institutions and with various purposes would not all use the CPS data unless the data were meaningful.

3.4. "Major Criticisms"

Defense states that the S&T note that the Tables and the underlying data have been the subject of "major criticisms" by representatives of the various departments of US government. With the exception of Harvey Hamel, they do not mention anything specific. While the S&T article does mention criticisms by Hamel and McNeil, these can be countered easily, as noted below

3.4.1. Hamel

Much of Hamel's criticism centers on the monthly survey, though *The New Worklife Expectancy Tables* use the March supplement to the CPS, not the standard monthly survey. This Supplement is the source of the data published by the Census Bureau in its 1983 and 1989 publications, *Labor Force Status and Other Characteristics of Persons With a Work Disability* (see Attachment B). Therefore, by virtue of these publications and the fact that the Census Bureau continues to calculate and disseminate work disability data, the government has acknowledged the validity of CPS data for measuring the earnings and employment

experiences of persons with a work disability. These data are also validated by virtue of their repeated use by other nonforensic researchers.

When discussing the March supplement, Hamel notes that the data ". . . would not provide overall estimates of the disabled population or workforce." Note that this caveat for use of the data is that the CPS should not be used to measure the size (prevalence) of the disabled population. Hamel notes that this arises from the fact that the CPS does not attempt to measure persons with a non-work disability. The criticism is not relevant to The Tables, since Hamel's preferred definition includes people with a disability who are not limited in the amount or kind of work they can perform. This definition is much broader than the work disability definition relevant to forensic cases, the definition used by the CPS and in The Tables.

There is no official government position against use of the CPS to define Work Disability. The Census Bureau regularly generates cross-tabulations of these data and publishes it on its web site. In fact, two noted former Census officials (McNeil and Miller, Attachments D and E) have authored affidavits to the validity of CPS for measuring work disability.

3.4.2. McNeil

The S&T article also mentioned work done by John McNeil in an attempt to discredit the Tables. McNeil himself rebutted specific issues raised in S&T (2000; see Attachment B). McNeil is the retired Special Assistant for Disability Statistics from the Census Bureau. While employed there, he was responsible for producing the disability-related data from the Bureau's various surveys. McNeil's belief in the CPS data for studying the employment effects of disability has already been documented in Section 3.3.2. His article, his use of the CPS data, and his signed affidavit clearly show that S&T misinterpreted McNeil's work.

FURTHER, THE AFFIANT SAYETH NAUGHT.

_____

David S. Gibson
President, Vocational Econometrics, Inc.

Subscribed and sworn to before me, a notary public, in this ____of May, 2004.

_____

Notary Public

My Commission Expires_____