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Disability and the New Worklife Expectancy Tables from Vocational Econometrics, 1998: A Critical Analysis

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I. Introduction

Vocational Econometrics, Inc. (VEI) and Anthony M. Gamboa, Jr. of Vocational Economics, Inc. (VE) have published, 1987, 1991, 1995 and 1998 versions of worklife expectancy tables for persons with and without a disability (the Tables). These Tables purport to quantitatively differentiate disabled from non-disabled worklife expectancy. VEI's Tables have been orally discussed in the forensic economic community, as they are the only data set that attempts to accomplish this important task. By contrast, there are numerous government, university and private tables that have been developed to project worklife expectancy absent the disability component. In this paper the authors analyze the VEI Tables, including the 1998 version, and present the conclusion that these Tables are an unreliable and invalid source for projecting differences in pre- versus post-disability worklife expectancy.

It is with the Daubert (1993) and the more recent *Kumho Tire Co. v. Carmichael* (1999) decisions that an increasing focus has been placed upon the foundation for expert testimony in litigation. Expert opinions within the broad spectra of both "hard" and "soft" sciences have come under the increasing scrutiny of judges, ("the gatekeepers"), to meet a standard of validity and reliability for admissibility. Specific attention of the courts has been upon explanations (or lack of explanations) of data and methodology used in the formulation of expert opinions and testimonies.

Recently, Horner and Slesnick (1999) have addressed the issue of expert explanation when noting that there are definitional ambiguities in attempting to measure economic damages incurred from wage losses as a result of injury or death. It is within the context of such ambiguity and ongoing judicial scrutiny that the focus of attention in this presentation addresses the data and methodology of the Tables that first appeared in Brookshire, Cobb and Gamboa (1987). The use of the Tables and the underlying Life, Participation, Employment (LPE) approach is examined here in light of the trend for substantive reliability and validation expected of proffered expert testimony.

Using a Life, Participation and Employment (LPE) approach the Tables group worklife expectancy by gender and educational attainment (<12 years,

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12 years, 13-15 years, 16 years or greater, and all educational levels). The Current Population Survey (CPS) questionnaire data were utilized to disaggregate participation and employment rates for persons defined as severely and non-severely disabled. However, it will be demonstrated that the CPS data was never intended to be utilized, and is essentially unsuitable for use, as a disability-screening device for the purposes of forecasting differences in worklife expectancy.

There are two main differences between the 1998 and the 1995 VEI Tables. These are: (1) the 1998 version of the Tables disaggregates the data into Severely Disabled, All Disabled, Not Severely Disabled and Not Disabled categories vs. only showing Non-disabled and Disabled categories in the 1995 version; (2) the race-specific breakdowns used in 1995 (incorporating race-based mortality and using participation and employment probabilities unconditional upon race) have been abandoned in 1998. *Ceteris paribus* the first factor appears to represent improvement, as it seems to permit greater tailoring, the second conversely appears to reduce the ability for tailoring as it ignores interactions between race and education.

The forensic economic literature surprisingly provides only a brief review of these successive Tables. These include a book review by Frank P. Corcione (1995), and the follow-up exchange between Corcione and VE associate Gluck (1996), and the comment by VEI President David S. Gibson (1998). Most of these references concerned the 1995 Tables, while Gibson's 1998 comment attempts to answer Corcione's criticisms and touts the 1998 release. To our knowledge, all favorable published comments about these Tables have only come from those associated with VE or VEI.

Corcione (1995, 1996) criticized issues of both substance and style, i.e., (1) "imprecise explanations" in the use of the six-year weighted average participation and participation employment rates; (2) "erroneous explanation" of life expectancy calculations, with omissions of "table closure;" (3) failure to allow for some or additional future disability in the construction of the Tables; and (4) failure to distinguish between disabled and severely-disabled in the charts.

An average joint probability of participation and employment along with the sample size is reported in the Tables' Appendix C for each set of categorized expectancies (sex, age, educational attainment, and disability status). These form the basic building blocks of the worklife Tables. For example, for men, age 25-34, with 13-15 years of education who are disabled but not severely so, in the years 1992-1997 the averages (with sample sizes in parentheses) are .685(146), .689(180), .737(167), .865(208), .845(161) and .842(152). VEI computes the weighted average and uses it in its table construction. For their approach to be valid there must be a constant population mean across the years 1992-1997. If the population mean is time-varying, the weighted average computation does not estimate a statistical parameter that would be of any valid use for constructing useful tables beyond a single year near the midpoint of 1992-1997.

Our econometric discussion in the next section supports Corcione's criticism of the six-year weighted average construction, so that the methodology used to build the Tables is statistically flawed. Gluck attempted to justify the underlying methodology but could not do so convincingly. Subsequently, the underlying data was disaggregated for the 1998 Tables to create more categories—which compounds the methodological flaws and diminished the Table's validity and utility even further.

Corcione (1996) suggested the use of Dickey-Fuller tests to assess the assumption of constant means. The authors do not believe that this approach would shed light on this problem. Dickey-Fuller tests for a form of autocorrelation implying a random walk component, which would eventually push probabilities outside the interval from 0 to 1. They are impractical here, since we are dealing with only six observations—the smallest sample size appearing in the Dickey-Fuller paper is 25. This sample size is simply too small for an asymptotic justification.

Additionally, Corcione questions the procedure by the VEI researchers which invites users of its 1995 and earlier Tables to make subjective assessments of the "continuum of disability." It is further suggested that this is done without a "specific theory or model." Corcione concludes, "this kind of vocational assessment becomes little more than an informed 'gut feeling'." (1996, p. 342) The authors concur and develop this theme below.

II. Methodology

The construction of the Tables seems to invite the use of further dubious methodology by users. Practitioners adopting the VEI Tables have been observed to use broad and discrete percentages in the process of selecting a "continuum of disability," i.e., 25%, 50% or 75% disabled. For example, the unimpaired worklife may be 20 years while the average disabled (1995 Tables) may depict six years. By using a 50% continuum (half way between disabled and non-disabled), the practitioner using the Tables would reduce the 20 years of non-disabled worklife in the example down to a 13-year disabled worklife expectancy (20 - 6 = 14) (14 x .5 = 7))(20 - 7 = 13).

A user of the Tables would seemingly have to make a case that the injured party is worse than severely disabled to justify a zero worklife expectancy; for example in the case of a 47-year-old female with 16 years of education (the 1998 Table lists 2.0 years of worklife in the severely-disabled category). The irony is that without the adjusted and increased worklife inherent in the continuum, the literal meaning of the disabled or severely-disabled categories would seem to require the use of worklife expectancy greater than zero in most cases. Moreover, there appears to be no known substantive vocational methodology by which one can reliably or validly determine a percentage or category of disability for any of the Tables.

VEI could have considered Dillman's functional loss of earning capacity criteria, including reductions in labor market access, reduction in time available for work (part- versus full-time application), and decreased competitiveness reflected in either unemployment or underemployment measures (Dillman, 1987, 1998). The vocational expert and/or forensic economist using the Tables would have to be careful not to double-count pay and worklife reductions, especially if reduced work hours are contemplated and are part of the framework for opining decreased competitiveness, and consequently worklife expectancy. Essentially, these variables may be interrelated.

The VEI Tables employ data from the Current Population Survey (CPS) by combining and matching data from the core (monthly) questionnaire and the March supplement. With the VEI 1998 Tables, if any one of four conditions is met, (conditions 3 through 6 on the next page), the person is assumed to be severely work-disabled. Conversely, if none of these four conditions are met, yet the disabled individual falls within one of the remaining three (conditions 1, 2, or 7) he/she is assumed to be non-severely disabled.

1. Has a health problem or disability that prevents one from working or limits the kind or amount of work one can do; or

2. Has ever retired or left a job for health reasons; or

3. Has not worked in the survey week because of physical or mental illness or disability that prevents the performance of any kind of work for at least an anticipated six months; or

4. Has not worked in the previous year because of illness or disability; or

5. Is under 65 years of age and was covered by Medicare in the previous year, or

6. Is under 65 years of age and was a recipient of Supplemental Social Security (SSI) in the previous year; or

7. Received veterans' disability compensation in the previous year (1997 and later). (VEI Tables, 1998, p. 4)

The criteria used by VEI to categorize and disaggregate the (CPS) data (apparently a throwback to P-3, No. 160, 1989 and P-23, No. 127, 1982) contain numerous confounding variables, some of which are subsequently discussed in BLS economist Harvey Hamel's 1994 letter eschewing the use of Current Population Survey (CPS) data for disability research.

The initial CPS criterion (condition 3—currently not in the labor force because of a disability yet with anticipated loss of work for at least six months) categorized by VEI as "severe disability" could conceivably include individuals who have sustained relatively minor or non-permanent, yet prolonged or recurrent injuries or illnesses, that are nonetheless medically considered temporary in nature. They may not lead to any permanent occupational impairment or disability. There exists no pre-survey specific time element to the question other than current work status during the survey week. Consequently, an employee out of work for literally less than one week, yet hoping for disability benefits could answer yes to the question that according to VEI identifies severe disability. *Inclusion of this response segment in the Table's severely disabled category would appear to substantially skew worklife expectancy downward for those individuals whose inclusion overstates the persistence of time out of the labor force* (U.S. Department of Labor, Bulletin 2478, 1996, 294-296). Yet, there is no way to know how many of these not so "severely injured" persons might answer yes to condition 3.

For the year 1993, there were 2,252,591 occupational injuries and illnesses involving days away from work (as reported to the U.S. Department of Labor). Of those, 50.0% involved five days or less of missed work. Only 19.0% of the 2,252,591 illnesses or injuries involved more than one month away from work.

The next VEI "severe disability" criterion (condition 4—had not worked in the preceding year because of illness or disability) is confounded by the illness component. Illnesses include congenital blindness, heart disorders, brain damage, severe spinal disorders and other disabling conditions from birth that

have always significantly impaired or even precluded employment. Such conditions are substantially different from work or personal (tort) injuries. In contrast to the chronic congenital factors (illnesses) listed, injuries are most frequently only partially as opposed to totally disabling. Yet again, there is no way to control for and eliminate "variations" in the CPS data to permit valid use by VEI in their Tables. Failure to eliminate such illnesses introduces measurement error and statistical noise of unknown magnitudes.

Another applied scenario that undermines the use of a yes on condition 4 as showing "severe disability" is a workers' compensation claimant answering "yes" yet being on the verge of completing a vocational retraining program at the post one-year interval. There would also be 60 days of professional job placement assistance in front of him/her. In such cases, there may be no worklife impairment for jobs within the medical work restrictions. The targeted job must also have a proven labor market. The average California workman's compensation case takes approximately 18 months to transact from onset of injury to job placement (return to work) despite myriad legislative and administrative rule changes designed to expedite the process through early medical identification of permanent disability and timely vocational intervention.

The final two severe disability factors (conditions 5 and 6—under age 65 and receiving either Medicare or Supplemental Social Security) do in fact suggest more significant disabilities. For example, the Social Security Administration (SSA) has high standards for rendering one totally disabled. Still, the recipient may only be temporarily (one year) totally disabled. The time frame of disability may also be subject to annual review. Despite the rather substantial standards of the SSA, vocational retraining is not an element considered in attempting to identify suitable, gainful employment. This factor can make all of the difference in post incident employability. The same confounding factors noted in condition 4 could also impact on conditions 5 and 6. Specifically, profound and chronic illnesses such as Down's Syndrome may be significantly depressing the outcome worklife figures. From a vocational standpoint, the greatest contraindications in the use of CPS data to estimate impaired worklife include the survey's significant failure to identify type of disability, and whether the disability is temporary or permanent.

The methodology used to create these Tables inappropriately assumes that a yes for CPS categories 3,4,5 and 6 demonstrate severe disability. These broad CPS categories lack specificity and reliable definitions since some of these groups presumably include individuals without any remaining worklife expectancy (totally disabled) and others who may be temporarily disabled without any predictable reduction in worklife. This depicts a major problem for the valid or reliable use of the Tables as the CPS data are aggregated while individual injuries are client-specific, and there is no good way to "tailor" the Tables even with the new severe and non-severe groupings.

These Tables represent a throwback to the pre-Markov process days of conventional worklife tables, before the increment-decrement approach of the now classic (1986) BLS Bulletin 2254. The disability state is implicitly assumed to be permanent, much as the death state or out-of-the-labor-force state was before the 1986 methodological revision by Shirley Smith at BLS. This change in methodology was detailed in the BLS (1982) Bulletin 2135. The LPE and older conventional worklife methods rest on cross-sectional data at a point in time (or average) to measure movements into and out of the job market. One departure from both BLS models is that unemployment is additionally

included in the VEI worklife definition. Thus, worklife in the BLS sense has implicitly been redefined.

A second departure is that the valuable initial participation state (active or inactive) information is discarded. Users of Bulletin 2254 are aware of the extra years of worklife that come from being in the active or participatory state. This factor is vocationally relevant, as career consultants are aware that it is almost always easier to secure employment while employed in contrast to seeking employment while unemployed. This is especially true if significant gaps between employment exist. *The failure to incorporate such information is particularly damaging in the VEI case because the knowledge that, post-accident, the subject is participating and/or is employed is valuable information that is not utilized in the VEI Tables.*

Consider the common forensic economics situation where an accident (personal injury) results in an impairment (permanent partial disability) that causes movement from physical labor (e.g., a construction trade) to a light duty job (e.g., an inspector). The fact that the subject is able to participate and has a post-injury job is significant information. It would cause a forensic economist to focus on the differential earnings and fringes after the replacement job had begun. For a light-duty job, the subject is, in most cases, not disabled whereas he was disabled with respect to the heavier construction job. By ignoring this information, the Tables lump the plaintiff with other non-comparable "disableds," lowering the participation rate (from its observed level of 100%) and further introducing a "disabled" unemployment probability, thus markedly diminishing post-injury worklife expectancy. This is incompetent vocational rehabilitation assessment and leads to bad economic loss valuation. The primary objective of the rehabilitationist is to identify and then secure the person/environment/job fit taking the employee's entire life cycle into consideration (Dillman and Toppino, 1998, p. 7).

Despite cautionary warnings in the preface to each of the VEI Tables that each situation should be considered on a case-by-case basis, in actual practice this admonition is actually a "straw man" that attempts to obscure the shortcomings of the Tables. The user of the Tables is left with one of two choices. He/she can either utilize the Tables' face value disabled worklife figures or attempt to ascribe a continuum or degree of disability as previously described. Neither of these options can be done reliably or validly due to the flaws in table construction.

The VEI disability definition (The Tables, 1998, Exhibit A, p. 9) classifies people as having a work disability if the respondent meets any of the seven conditions delineated earlier. The elaboration in condition 3 (Has not worked in the survey week because of physical or mental illness or disability that prevents the performance of any kind of work for at least an anticipated six months) comes from inspection of Part B, Chapter 3 of the *Interviewer's Manual for the Basic Monthly Survey* on the bls.census.gov/cps/intmanb3.htm web site, where disability is defined as "a specific physical or mental condition that prevents the individual from working. Not a combination of minor health problems that normally come with advanced age."

These seven disability factors may be found in a number of other reference sources, sometimes in combination (Table No. 622, *Statistical Abstract of the U.S., 1998*; and InfoUse's *Chartbook on Work and Disability in the United States, 1998* by Stoddard, Jans, Ripple and Kraus prepared for the U.S. Department of Education, National Institute on Disability and Rehabilitation Research). *Severe work disability in the VEI definition* (as regards conditions 3

through 6) *appeared in U.S. publications in the 1980's but as noted later the definition has since been abandoned.* Condition 7 (received veterans disability compensation in the previous year) is relatively recent, making comparability across years a potential problem. Again, the presence of conditions 1, 2 or possibly 7 (to the exclusion of 3, 4, 5, and 6) results in the determination of non-severe work disability.

Neither the monthly Current Population Survey data nor its more extensive March demographic supplement (the basis of the Table's worklife probability calculations) are meant for or collected for the task of measuring the employment status of persons with disabilities. To understand this problem, note that persons are asked whether they (or a person in their household) are "prevented from working" or "limited in the kind or extent of work they can do" by a "health problem." This key question has several difficulties:

1. It is not validated with other objective measurements of disability;

2. It confounds and mixes a general impairment with other factors such as transferable work skills, physical, emotional and psychological capabilities, and labor market conditions along with environmental aspects such as workplace accommodations and availability of transportation in concluding that work is prevented;

3. The "limits the kind or amount" is inherently ambiguous—is it before or after selection of the post-injury job or is it an innate impairment? How is a person who *was* limited, but for whom accommodation has been made, and which has minimized or removed the limitations supposed to answer the question?

4. It does not lend clarity to the "health problem" in condition 1 and the "illness" in condition 4, and may not be at all representative of the subject being assessed. Indeed if the CPS sample is dominated by respondents whose conditions of not working might include congenital back or spine problems, arthritis or rheumatism, cancer, deafness, blindness, diabetes, heart trouble, high blood pressure, mental or emotional problems, mental retardation, stroke, etc., one might ask on what basis are the employment or participation rates of workers with these conditions relevant to workers with impairments that merely caused job substitutions (requiring light lifting or restricted bending or even non-exertion sedentary work)? This appears to be the case from Table 30 of *Americans With Disabilities: 1991-1992* (McNeil, 1993).

The CPS data define disability inappropriately for forensic economics purposes because the questions asked are not intended to measure employment and participation statuses of various classes of functional impairments. Rather, the key question for part 1 of the disability definition above is meant as a screener to identify households receiving disability-related income. Page 101 of the CPS Field Representative/CATI Interviewer Memorandum No. 99-03 Section I (March 1999) makes this clear. Further, field representatives are told on this page that "the injury, illness, or disability need not have been job-related." *The preferred source for questions involving disability is the SIPP—the Survey of Income and Program Participation.* John M. McNeil's work and web pages at the Bureau of the Census make this clear. *The SIPP is*

longitudinal, tracking individuals over three years whereas the CPS is a "roof-top" annual survey tracking specific addresses. The former, unlike the CPS, contains information on employment measures and functional limitations, along with some impairment data.

Indeed, the most recent BLS publication addressing disability, "Persons with Disabilities, Labor Market Activity, 1994," (Hale, Hayghe and McNeil, *Monthly Labor Review*, September 1998) reports exclusively on SIPP data. Instead of defining disabilities based in large part on employment outcomes that focus on only part of the population (the disabled without jobs), the SIPP definition is functionally based and applied uniformly to the disabled and non-disabled populations. The SIPP measures outcomes of individuals such as those who have difficulty or an inability to lift and carry a full bag of groceries. While methodologically cleaner, Hale, et. al., observe that a great deal of aggregation is still present. For example, footnote 2 is critical of the notion of moderate disability: "It is likely that the group with moderate disabilities ranges from persons with virtually no disabilities to those with disabilities that are close to severe." (p. 10) (This comment of course applies to the 1998 VEI Tables' "not severely-disabled" category.

It is impossible to differentiate the characteristics of those in the "severely disabled" population, since one qualifies on the basis of any of several, possibly overlapping criteria. Those meeting the SSI criterion need to have little wealth and little income, since SSI is a means-tested program. Those receiving Medicare under 65 would be expected to resemble those awarded OASDI benefits, since after receiving OASDI for 24 months one qualifies for Medicare. *The Social Security Bulletin (1997 Supplement) shows that only 4.4% of the principal diagnoses causing social security disability resulted from injuries.* This is to be compared to the 18.9% with mental disorders, 22.9% with musculoskeletal disease, 12.9% with circulatory system disease, 10.1% with neoplasm and 7.4% with nervous system and sense organ problems. These percentages vary by sex and age. Therefore, use of the Tables to project statistics for the severely-injured results in the unnecessary introduction of a huge element of statistical noise and unreliability.

The next three paragraphs offer econometric criticisms, which are more technical in nature than the remainder of the paper. Despite the points comprising the focus of this paper, this technical discussion assumes, arguendo, that our data objections could be overcome.

We may test the VEI specification by introducing a time trend as well as an overall constant mean and econometrically fitting the expanded model. Then by performing a standard statistical significance test on the trend coefficient, we may formally test the proposition that there is the parameter stability of the mean, which is required.

The building block averages quoted earlier come from an underlying data set in which we observe only 0's (not both employed and participating) or 1's (both employed and participating). Thus at the individual observation level we are estimating probabilities—here, a linear probability model. With all of the individual data we could entertain probit or logit specifications, but the summary data in Appendix C of the Tables give only enough for linear probability specification error tests. Since the variance of one observation on an individual is p*(1-p) for constant p, the probability of being in the PE state, under our alternative, p varies over time because of the posited time trend. Also, the number of observations in the group means above varies from year-to-year, introducing another source of heteroscedasticity into the error structure.

For these two reasons, it is inappropriate to estimate our equation by OLS (ordinary least squares) if we use the reported OLS variance covariance matrix in significance testing. OLS with a corrected (for heteroscedasticity) covariance matrix, or GLS (generalized least squares, with a consistently estimated covariance matrix) are appropriate, the latter being more efficient.

We have performed this test in a few situations where this model is likely to be used. We looked at males and females, age 25-34, who were disabled but not severely. In both of these cases we found the trend coefficient to be statistically significant with a "t" (more accurately, "z") statistic in excess of 2, so that the VEI model is rejected at the 5% level. On this ground alone, these Tables fail to pass muster. In fact, the test statistics were found to be 4.99 and -2.03, respectively—the trend is upward for males and downward for females. It is possible that the undefined heading "Quan" in Appendix C of the Tables refers not to a number in the CPS, but rather to an estimate, in thousands, for the U.S. population. If so, then the sample size in the CPS would divide "Quan" by 2, since the CPS is a 1 in 2,000 sample. We re-ran our tests in this case and found the test statistics to be 3.53 and -1.43; the increasing trend for males remains statistically significant, invalidating the six-year averaging and statistical underpinning of the Tables.

III. BLS on Its (CPS) Definition of Disability

In a 1994 letter to an American Board of Vocational Experts (ABVE) Board officer following the December 1993 CPS redesign meeting in Chicago, Harvey R. Hamel, a senior supervisory economist at the BLS, stated the following in reference to the CPS monthly survey:

> 1. Respondents to the monthly survey are never asked directly if they are disabled. The information is obtained only if volunteered by the respondent.
> 2. The available data are limited to persons outside the labor force and may understate the disability problem even among this group. The survey does not elicit any information whatsoever on possible disabilities of persons who are either employed or unemployed.
> 3. There is no way to verify or certify disability status; and
> 4. There are no criteria for defining what does or does not constitute a disability.

The foregoing applies both to the historical data based on the former CPS questionnaire as well as to the data from the redesigned survey that was put into operation in January (1994).

Economist Hamel went on to say:

> As you are aware, a few questions on disability are included in the annual CPS income/work experience supplement conducted each March. It is, of course, possible to cross-tabulate data on disability status and income with current labor force status and/or experience over the prior calendar year. Even those data however, would not provide overall estimates of the disabled population or work force. One problem is that there is no information on persons with disabilities that do not limit the kind or amount of work they can do. Also, for persons with disabilities that limit their work activities, there is no inquiry as to type of disability, and no indication of whether the reported disability is temporary or permanent.

Hamel opines that the SIPP data are the preferred data source on the disabled population. *He made the point that if individuals possess an impairment, but through job choice or accommodation they do not feel limited in their job by that impairment, then they will be incorrectly deemed non-disabled by users of the CPS data such as that data contained in the disabled WLE Tables.* Resulting statistics from improperly recorded data will suffer the usual fate of biases from measurement error. In this case, the bias can result in an understatement of the extent to which the disabled or "not severely disabled" participate or find employment. Therefore, it appears there is no way to use the Tables as a valid and reliable indicator of the worker being assessed.

IV. The Census Bureau on the Disability Definition

The discussion in this section, except for the last paragraph, is taken from the U.S. Census Bureau SIPP web site at

http://www.census.gov/hhes/www/disable/sipp/measure.html.

> Interest in tracking the employment status of persons with disabilities has grown since the passage of the *American with Disabilities Act of 1990* (ADA). The primary national source of data on labor force status (the *Current Population Survey* (CPS)) has been used by some analysts, *even though that survey does not actually attempt to identify the appropriate universe of persons with a physical or mental impairment which substantially limits one or more of the major life activities.* (italics added).
>
> The disability questions that are asked in the monthly CPS and in the annual March supplement have specific purposes that make them inappropriate for identifying such persons. The disability question that is asked in the monthly core is intended to identify persons who are out of the labor force because they are prevented from working. The March supplement question on whether there are persons in the household who are prevented from working or who are "limited in the kind or amount of work they can do" is asked as a screener to identify those households in which there is some likelihood that one or more persons may be receiving disability-related income.
>
> On the other hand, the disability supplements that have been asked in the *Survey of Income and Program Participation* (SIPP) were designed to be consistent with the ADA definition of disability. The supplements obtain information on:
>
> * the ability to perform specific functional activities (seeing, hearing, having one's speech understood, lifting and carrying, climbing stairs, and walking),
>
> * certain ADL's or activities of daily living (getting around inside the home, getting in and out of a bed or chair, bathing, dressing, eating, and toileting), and
>
> * certain IADL's or instrumental activities of daily living (going outside the home, keeping track of money and bills, preparing meals, doing housework, and using the telephone).
>
> The survey also collects information on the use of special aids such as wheelchairs, canes, and the presence of certain conditions related to mental functioning, and the ability to work at a job or business. . . .Another measurement issue concerns the criteria used to classify someone of working-age with a severe disability. Given the fact that working at a job or business is clearly a major life activity, SIPP disability data treat persons who report

that they are unable to work at a job as having a severe disability. Yet, if we are tracking the employment status of persons with a severe disability, is it proper to include in that category persons who report that they are "unable to work"? Part of this issue concerns the meaning of unable to work. When a person reports that he or she is unable to work, that person is making a judgment about workplace accommodations and the availability of transportation. Changes in the workplace and transportation environments could result in far fewer persons describing themselves as unable to work.

The following definitions and figures note the number of persons 21 to 64 with a severe disability. These figures are based on three alternative definitions and illustrate the corresponding employment rates.

Definition 1	is the definition used in the publication *Americans With Disabilities: 1991-92* (McNeil, 1993),
Definition 2	excludes from the severe category all persons self-identified as "unable to work", and
Definition 3	excludes work disability as a criterion for determining whether a person has a severe disability.

To understand the difference between the last two definitions, consider a person who uses a wheelchair and reports that he or she is unable to work. That person would be excluded from Definition 2, but would be included in Definition 3.

The attached table depicts employment rates by disability status and depicts which 1991 to 1994 changes are statistically significant. The ability to measure change is determined, in large part, by sample size. The desire to look at samples as large as possible is the rationale for presenting combined panels. The approximate size of the first file was 34,000 households, and the approximate sizes of the second and third files were 40,000 households. The next full SIPP disability supplements have been scheduled with several completed. Specifically, the fifth and eleventh waves of the 1996 panel are scheduled for June 1997-Sept. 1997 and June 1999-Sept. 1999, respectively). The 1996 panel will have a sample size of 37,000 households and will include 12 waves (households will be visited 12 times at four-month intervals).

Persons With Severe Disability	1991 (Sept-Dec)		1994 (Sept-Dec)	
	Number (000's) employed	Percent employed	Number (000's) employed	Percent employed
Definition 1 (basic SIPP definition)	12,494	23.3	14,219	26.1
Definition 2 (excludes persons "unable to work")	4,311	60.3	4,337	72.7
Definition 3 (does not use ability to work as a criterion)	8,624	30.1	9,506	33 9

The 1991 to 1994 changes in the percent employed are statistically significant at the .10 level for all three definitions. Numbers are extrapolated to the entire U.S Population.

Clearly there is substantial variation depending on the nature of the disability chosen. Moreover, when persons are not allowed to nominate themselves as "unable to work" the percentage employed rises by a factor of two to three.

V. The Tables Implicitly Deny Efficacy of Physical and Occupational Therapists

Use of a broad category such as "not severely disabled" would in almost all instances completely deny the efficacy of physical and occupational therapists (who may be involved in the case). Apparently, only if the therapy completely removed the disability would the Table's methodology acknowledge its existence. In all other cases, the therapy does not change the disability grouping or worklife. It is conceivable and realistic that certain interventions, programs or procedures even after the artificial one-year time frame (criterion item 4) might change the status of the individual from severely to non-severely disabled. How does one move between the data set's concrete categories?

An applied scenario is as follows: certain vocational rehabilitation programs utilize the services of occupational therapists. These include both transfer of dominance or one-handed retraining, e.g., clinically assisting and thus making a right-hand dominant person left-hand dominant, and work hardening programs. The latter are designed to incrementally enhance physical capacities for sitting, standing, walking, bending, driving, reaching and especially lifting. Proper body mechanics, assistive work devices, and job site environmental accommodations are implemented in addition to physical reconditioning programs. Such interventions not only enhance physical tolerances and stamina for work, they also conceivably allow a larger percentage of injured workers to sustain their usual and customary employment or access employment closer to their occupational past in terms of skills transferability. In both cases, from a vocational perspective, the employee maintains his or her experiential premium in the labor market. These are vocationally well-known to enhance pay, employment and worklife probabilities (and consistent with what labor economists refer to as human capital).

VI. Inappropriate Uses of Measures Just Because They Exist

This phrase captures the economic and statistical essence of the use of the CPS disability data for many if not for most forensic economics situations involving permanent partial-disability cases arising outside of medical malpractice cases. This phrase also represents another misuse of the disabled worklife data and the title of a panel discussion presented by Corinne Kirchner to the Second National Disability Statistics and Policy Forum held in Washington, D.C., on June 20, 1995. She quotes from the monograph of the New Worklife Expectancy Tables for Persons With and Without Disability by Gender and Level of Educational Attainment (Gamboa, 1995) and a two-page VEI press release dated January 15, 1995 with the headline: "Since ADA, People With Disabilities Still Face Declining Employment Conditions." This press release noted that from March 1992 to March 1993 there was a 3% decline in combined labor force participation and employment for men with disabilities, and a 1% decline for women. This data was reported and discussed in articles in the *Wall Street Journal*, the *Chicago Tribune* and the *Philadelphia Inquirer*.

Kirchner likens the Table's methodology to that of looking for a dropped dime at night under a light post rather than across the street where the dime was dropped. The search is conducted where the light is because that is all that is visible. In addition to acknowledging the inappropriateness of the CPS data, Kirchner makes the useful observation that to the extent that the intervention (ADA) resulted in workplace accommodation this particular approach of the CPS methodology fails to pick it up because such people would fail to respond that they were limited in their work, nor would they seek SSA disability benefits.

The previous SIPP chart conflicts with both the VEI press release and the passage on page 17 of the 1998 Tables claiming lower participation and employment rates for persons with disabilities after the ADA. VEI reports having found a downtrend where in fact an uptrend is present. In McNeil's Study, the standard error yields a 90% level of confidence and it is difficult to see how VEI can make any meaningful comparison. The reasons cited in this paper are undoubtedly responsible for this result. The CPS is measuring something other than what most people (and the SIPP) think of as disability. There are still other conceptual differences between the SIPP and CPS measures noted on page nine of the September 1998 (*Monthly Labor Review*) article.

VII. Summary & Conclusions

The Vocational Econometrics, Inc. (VEI) Tables on Worklife Expectancy, inclusive of the 1995 and 1998 versions, purportedly differentiate disabled from non-disabled worklife expectancy. Using a Life, Participation and Employment (LPE) approach the Tables group worklife expectancy by gender and educational attainment (<12years, 12 years, 13-15 years, 16 years or greater and all educational levels). The CPS Survey questionnaire data were utilized to disaggregate participation and employment rates for persons defined as severely and not severely disabled. However, a thorough review and analysis clearly shows that the (CPS) was never intended to be utilized as a disability screening device beyond identifying the likelihood that one or more household members may be receiving disability-related income.

The monthly and annual March CPS supplement are an inappropriate mechanism for identifying such persons and disability categories. The Tables, when applied to individuals, are therefore invalid and unreliable for use in forensic economics. On the other hand, the SIPP was designed to be consistent with the ADA definition of disability, e.g., measuring functional activities and instrumental activities of daily living. These data have far greater relevance to work capacity. The SIPP also collects data on assistive devices, which in themselves more objectively characterize the severity of disability, ergo, a wheelchair rider versus a hearing-aide user. Still, thus far no one has attempted to use SIPP data to construct worklife tables.

Significantly, the preface to the 1998 VEI Tables states that from 1992 to 1997 rates of participation and employment decreased for persons with a disability. This is remarkable in that the unemployment rate during this time frame reached recent lows in the U.S. economy, creating labor shortages across many industries. Additionally, the full effect of the ADA legislation took place after 1994. The aforementioned statement, reported in the national print media, led to major criticisms from representatives from Social Security, and the U.S. Departments of Labor and Commerce as illustrated earlier. The pri-

mary criticisms concerned the use of the CPS data as an inappropriate screening and measuring device for worklife expectancy.

The contrasting SIPP statistical results pertaining to the improved employment rates of disabled Americans from 1991 to 1994 further suggest the Tables are not measuring what they purport to measure. Rather than declining participation and employment rates, the SIPP data depict statistically significant increases in employment for the disabled across three separate measures and definitions of disability. Given supply and demand factors and the lowest unemployment figures in the United States since the year 1970, one can expect even greater improvement during the forthcoming panel years (1995-1999).

Confounding variables are also apparent in the selection of criterion conditions 3 and 4 from the BLS definitions of disability in the CPS. The third item identified individuals who had not worked in the survey week due to long-term physical or mental illness, while the fourth item consisted of respondents who did not work in the previous year due to illness or disability. These individuals are not disaggregated by temporary or permanent conditions, injury type, illness or injury, or by congenital conditions that may have precluded employment opportunities since birth, e.g., Downs Syndrome. Moreover, rehabilitation claimants' who are on the verge of completing back-to-work plans within appropriate medical parameters very well might answer yes to either conditions 3 or 4, yet be nearing re-employment with minimal-to-no anticipated impairment to worklife through the course of the remaining life cycle given the appropriate person/job/environmental fit post-injury.

Notwithstanding these points, the Tables classify these latter individuals in the severely disabled group. Similar confounding variables affect the non-severely disabled category given the lack of objective functional measurement. For example, criterion condition 2, which states, "have you ever left a job for health reasons," could include numerous conditions that have been completely and permanently resolved such as a gall bladder, pregnancy or even a recurrent kidney stone condition.

VEI's assertion of employment trends among the disabled are further invalidated by their failure to evaluate statistical significance and standard errors of measurement. Other concerns include the Table's lack of actual peer review regarding use of the underlying data set in any vocational or economic journal (this may be related to the proprietary development and use of the study), the failure to establish or employ existing vocational methodologies to address the continuum of disability, and the reliance on inappropriate data to create invalid and unreliable categories of disability and worklife expectancy. There is also no valid or reliable method to integrate the potentially beneficial effects of vocational and medical rehabilitation or the legal mandate for mitigation, as the Tables assume each disabled person will remain static and unimproved. No possible intervention exists to move the disabled plaintiff to either a non-severe state or a normal worklife position.

Finally, econometric testing of the Table's database confirmed Corcione's original objection. Specifically, the six-year weighted average (constant mean, 1992-1997) was invalidated as testing revealed a statistically significant uptrend in employment for "not severely disabled" males during this time frame. Each of these many factors combine to categorically impeach the VEI Tables as unsuitable for determining the level of worklife impairment due to disability.

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http://www.infouse.com/disabilitydata/

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http://www.census.gov/hhes/www/disable/sipp/measure.html

Department of Labor, Bureau of Labor Statistics
http://stats.bls.gov

National Center for Health Statistics:
http://www.cdc.gov/nchs/about/major/nhis_dis/nhis_dis.htm

National Institute on Disability and Rehabilitation Research:
http://www.ed.gov/offices/OSERS/NIDRR

University of California at San Francisco, Rehabilitation Research
Training Center on Disability Statistics
http://www.dsc ucsf.edu