

An Essay on the New Worklife Expectancy Tables and the Continuum of Disability Concept

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I. Introduction

We announce here *The Very New Disabled Work Life Tables* (tm) also referred to as *The Very New Tables* (tm), (Copyright 2001) which simultaneously remedy the following seven problems in *The New Worklife Expectancy Tables: Revised 1998 By Gender, Level of Educational Attainment, and Level of Disability* (referred to as *The New Tables*) by A. N. Gamboa (1998) of Vocational Econometrics, Inc (VEI).¹

II. Problems Overcome With *The Very New Tables*

Problem 1

It has been pointed out several times (Gibson, 2001; Gibson and Tierney, 2000) that *The New Tables* represent the only worklife tables for the disabled population. This is no longer the case; in fact, this paper produces infinitely many more tables.

Problem 2

It was pointed out by Skoog and Toppino (1999) and by Ciecka, Rodgers and Skoog (2001) that *The New Tables* as constructed contain gross heterogeneity bias, specification error bias, and sample selection bias. None of these biases are present in *The Very New Tables* (tm).

Problem 3

The New Tables are costly and proprietary. *The Very New Tables* (tm) may be freely used by anyone with fair use copyright access to *The Journal of Legal Economics* (Winter 1999-00) through membership in the American Academy of Economic and Financial Experts or by anyone who is a patron of a library subscribing to that journal. Further, the bases of *The Very New Tables* have been subject to peer review.

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¹For readers who are tempted to look ahead, it will become clear that *The Very New Tables* are constructed from existing tables, thereby obviating printing several pages of worklife expectancies.

Problem 4

The Very New Tables (tm) have eliminated still another bias mentioned at the American Rehabilitation Economics Association (AREA) meetings (Ciecka, Rodgers, and Skoog, 2001) and first expressed by Corcione (1995), namely that the Not Disabled Tables (Gamboa, 1998) suffer from upward bias by building into the computation the incorrect assumption that workers, at the time of accident, never will become disabled in the future. Our *Very New Tables* (tm) allow the only legally tenable assumption that the worker at the time of injury was subject to the same future possibility of disabling injury as the average worker in the U.S. economy.

Problem 5

Unlike *The New Tables*, which incorrectly refer to their content as reflecting "worklife expectancy" (incorporating, as they do, unemployment, which is at odds with Smith (1986), Ciecka, Donley, and Goldman (CDG, 2000), and the definitions in increment-decrement worklife expectancy as the term has been used in learned papers over the past 20 years), *The Very New Tables* (tm) incorporate bona fide worklife expectancy reflecting the mathematical definition of expected labor force participation. Furthermore, as will be evident, the current state (active/inactive) will also appropriately be incorporated.

Problem 6

The New Tables are really three baselines, estimated from three populations that are subsets of the Current Population Survey (CPS) sample: the Not Disabled (ND), the Severely Disabled (SD), and the Not Severely Disabled (NSD) classifications, defined by the answer to seven questions listed by Gamboa (1998). These VEI/CPS questions are ambiguous as pointed out by Skoog and Toppino and create a definition of work disability whose measurement error is negatively correlated with participation and employment as indicated by Ciecka, Rogers and Skoog. These definitions, still used in tabulations posted on the Census web site, imply a population the vocational characteristic about which there is no understanding in the literature. Consequently, it is impossible to employ these populations scientifically as benchmarks from which to opine about disability, since a comparison is made of an (presumably) observed plaintiff and a statistically unknown comparator (e.g., the average NSD person). In contrast, *The Very New Tables* (tm) are based on two populations about which economists and vocational professionals presumably actually know something—the U.S. population and the very, very work-disabled, i.e., those, by definition, with a worklife expectancy of zero.

Problem 7

Researchers (Rodgers, AREA Meeting, 2001) have questioned *The New Tables* as a "black box" because the "continuum of disability" (Gluck, 1996 and

Gibson under "Adjustment to Specific Case") weightings are mysterious. Computer output from VEI's Worklife Probability computer program prints out the "continuum" assumption used for each particular case, which, if assumed to be 100%, will print instead the classification used (e.g., ND, NSD, or SD). *The Very New Tables* (tm) permit the vocational expert to opine using the precisely correct disabled worklife which fits the case, and, by a transparent procedure, to display the "molding" weights (w , below) called for repeatedly in Gibson. As such, *The Very New Tables* (tm) provide a methodology that is intellectually honest by displaying rather than hiding its weights.

Before proving results about *The Very New Tables* (tm), we explain some additional problems overcome and some positive advantages.

A. Simplicity of Computation

For a large proportion of cases, the analyst will need to make absolutely no calculations whatever. These will include many of those formerly injured workers who have gone back to work in mitigating employment who would not be expected to differ materially from the population at large, as well as those with very catastrophic illnesses.

B. Smaller Variance

The standard error of the estimated worklife is guaranteed to be lower or at most equal to that of the CDG tables. In many cases it will be zero. The result will be seen to follow from $\text{Var}(aX) = a^2\text{Var}(X) < \text{Var}(X)$ for $0 < a < 1$.

C. The Logical Equivalence of *The Very New Tables* (tm) to *The New Tables*

For the analyst preferring to express an opinion in terms of *The New Tables* instead of *The Very New Tables*, we provide an isomorphism between these tables, so that an opinion may be equivalently expressed in terms of *The New Tables*. Any "molded" opinion based on *The New Tables* may conversely be expressed in terms of *The Very New Tables*, so that any criticism of *The Very New Tables* is implicitly a criticism of *The New Tables*.

III. *The Very New Tables* Revealed in The Molding Equation

Let CDG_{WLE} equal the worklife expectancy for the worker with the sex, age, and educational background reported in CDG (2000). The Fundamental Equation (of molding and non-molding alike) is:

$$1) \quad \text{Very New}_{\text{WLE}} = (1-w) 0 + w\text{CDG}_{\text{WLE}}$$

for w between 0 and 1. Many users of *The Very New Tables* will simply set $w = 0$ or $w = 1$. If the analyst believes the person is not work disabled, he or she sets $w = 0$, in which case *The Very New Tables* worklife estimate reduces to

CDG's estimate. If the analyst sees that the worker is totally worklife disabled, he or she sets $w = 0$, so that *The Very New Tables'* worklife estimate is zero. These may be referred to as "no-molding solutions." Again, these choices have a scientific, reliable and relevant basis, since the underlying reference points are zero and CDG_{WLE} , both well-understood and reliable numbers. If the analyst thinks the worker is somewhat disabled, he decides "how much" by inserting a "molded" $VeryNew_{WLE}$ opinion, which "incorporates all relevant information" into the Fundamental Equation. Then the analyst solves for the weight w by computing $w = (VeryNew_{WLE})/CDG_{WLE}$, the "continuum of disability."

The beauty of the Fundamental Equation and its equivalent, $w = (VeryNew_{WLE})/CDG_{WLE}$, is that the analyst may mold as he or she sees fit. In some problems w (using round numbers like 80%, 85%, 90%, 95%, etc.) may be specified directly, and in other cases the worklife expectancy may be directly specified, e.g., David Toppino has made an oral suggestion (AREA Meeting, 2001) that $VeryNew_{WLE} = CDG_{WLE} - .5$ in order to allow one-half year for an operation and recovery period after some disabling events. In still other cases, $VeryNew_{WLE}$ may be inserted directly, and the Fundamental Equation lets one compute and announce the appropriate "continuum of disability."

We now state the following theorem, followed by its proof:

Theorem

There is logical Equivalence of *The Very New Tables* (tm) to *The New Tables*. Given the w molding factor and the entries in both *The New Tables* and *The Very New Tables*, the v molding factor (not necessarily restricted to be positive) needed by VEI may be computed (see equation 2). Conversely, given the v molding factor announced by VEI and the entries in *The New Tables* and *The Very New Tables*, the w molding factor (here not necessarily restricted to be less than 1) used in *The Very New Tables* (again required to give the same disabled worklife expectancy) may be computed with equation 3).

Proof

Let v be the VEI "continuum of disability" weight that the VEI analyst believes represents the proper "molding." Let NSD_{VEI} and ND_{VEI} represent the VEI worklife expectancy entries for the worker with the sex, age and educational background reported by Gamboa (1998), and $MOLDED_{VEI}$ is the "molded" VEI expert opinion of this person's worklife expectancy. Thus,

$$MOLDED_{VEI} = (1-v)NSD_{VEI} + vND_{VEI}$$

so that for equality of the opinion we require

$$wCDG_{WEI} = (1-v)NSD_{VEI} + vND_{VEI}$$

whence

$$wCDG_{WLE} - NSD_{VEI} = v(ND_{VEI} - NSD_{VEI})$$

from which follows

$$2) \quad v = \frac{wCDG_{WLE} - NSD_{VEI}}{ND_{VEI} - NSD_{VEI}}.$$

This equation expresses the VEI molding factor v in terms of *The Very New Tables'* molding factor w as well as the entries in both *The New Tables* and the CDG tables. Thus, the VEI "continuum of disability" factor has been released from Rodgers' black box and put prominently on public display.

Conversely, from equation 2) it follows that

$$3) \quad w = (1/CDG_{WLE})[v(ND_{VEI} - NSD_{VEI}) + NSD_{VEI}].$$

IV. Comments on The Various Worklife Tables

Prior to the most recent release, VEI (Gamboa, 1995) had only two sets of tables by disability in its 1995 edition—the Non Disabled and the Disabled. The molding factor or "continuum of disability" needed between these two tables would be completely different from the molding factors for *The New Tables*, since the old tables combined the SD and NSD populations. Thus, there must have been great flexibility in understanding the radical shifts in molding factors on the part of *The New Tables* users over only a three-year interval. Given this facility, these users will easily adapt to our baselines and be able to use the same judgment skills in selecting baselines. Indeed, given the common knowledge about our baselines, one would expect expert accuracy to improve. If one wanted weights to use in the latest VEI tables, the expert's most accurate algorithm (since the population in our tables is most readily understood) to arrive at the VEI factor v would be to compute our w factor first, and then use equation 2).

V. Conclusion

The reader may now have realized that the same disabled worklife may be calculated with appropriate molding from any previous edition of the VEI tables going back to 1987. Admittedly the v factor changes, but since there are no rules for the choice of v , this is no problem. Indeed, the VEI molding methodology permits one to dispense with all worklife tables altogether, by realizing that the Fundamental Equation may be generalized to

$$4) \quad MOLDED_{WLE} = (1 - u) 0 + uANYTABLE_{WLE}$$

where $MOLDED_{WLE}$ is the desired disabled worklife expectancy and $ANYTABLE_{WLE}$ is the age, sex, and education from any hypothetical worklife table the reader would like to imagine. Solving equation 4) for u gives the "continuum" for this table, which can never be discredited because it could be anything whatsoever. We have thus dispensed with even the CDG tables and, with

the newly discovered power of the molding factor, produced disabled worklives out of imaginary tables.

Lest the reader feel "too far out of the box" in this creation of testimony without the need for any bases that could be used to impeach it, we recommend that *The Very New Table* be said to rely on the CDG tables rather than the imaginary ANYTABLE_{WLE}; this may confuse a nasty attorney or judge considering a *Daubert* challenge. The basis for this recommendation is that the CDG tables have been peer reviewed, checked by both of the present authors, follow U.S. government methodology, and are reliable.

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