Social Welfare Generosity Scores in CWED 2: A Methodological Genealogy

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Introduction

Over the last two decades, scholars have made considerable progress developing comparative indicators of the scope and generosity of social policy. The Comparative Welfare Entitlements Dataset represents one of the most comprehensive systematic efforts to provide comparable information about national welfare programs around the world. Some other similar efforts include the Social Citizenship Indicators Project (Korpi and Palme 2007), the Social Expenditure Data project (Adema, Fron and M. Ladaique 2011), and the OECD/EU project on Tax and Benefit Indicators (Carone, Immervoll, Paturot and Salomäki 2004).

CWED 2 currently provides information on a variety of institutional characteristics of major social protection programs in more than 30 countries into the second decade of the 21st century (Scruggs, Jahn and Kuitto 2013). Some variables available in the CWED2 dataset have been aggregated to produce benefit generosity scores for each major social insurance program in the dataset: unemployment, sickness, and pensions. This generosity index updates and extends the CWED 1 generosity index, which was outlined in Scruggs (2007). This generosity index has been used in a large number of empirical studies (e.g., Easterlin 2013, Rothstein 2011, Bolzendahl 2010, Vis 2010); a more complete list of the over 100 publications using the CWED 1 data is available at the CWED2 website under "Publications".) This paper provides a brief explication of the methodology of the program generosity measures and a

descriptive analysis of trends of welfare benefit generosity in major social insurance programs. We begin with a brief description of the current CWED2 dataset.

CWED2 revises, updates and expands the CWED1 dataset (Scruggs 2004) by providing systematic data on institutional features of three social insurance programs - Unemployment Insurance, Sick Pay Insurance, and Public Pensions - in altogether 33 countries.[1] For each of these three programs, there is data on benefit replacement rates, qualifying conditions, and elements of the insurance coverage or take-up rates. Replacement rate information is provided for 1971-2010 for most of the OECD countries. Eligibility and coverage information is generally available for 1961-2010. For the Central and Eastern European countries, Taiwan and South Korea, data is generally available for a shorter period (1995-2010).

The basic conceptualizations of the variables are described in Scruggs (2007) and Allan and Scruggs (2004), while the early idea can be traced back to Esping-Andersen (1990). The addition of Spain, Greece and Portugal, the Central and Eastern European countries in the EU and South Korea and Taiwan extend the dataset to encompass many more countries. Unemployment insurance covers national insurance provisions earned without income testing. Sick pay insurance covers benefits paid in the event of short-term non-occupational illness or injury. This includes provisions for mandatory private (employer-paid) benefits in addition to public insurance. Public pensions considered in the CWED2 dataset include only mandatory public programs. They exclude occupational pensions except for the nominally private Finnish earnings-related fund. Besides earnings-related mandatory public pensions, data is also provided for replacement rates of minimum pensions (i.e., for persons without working history).

The information on replacement rates, eligibility criteria and duration of benefit payment is calculated for a notional average production worker in manufacturing sector who is 40 years old and has been working for the 20 years preceding the loss of income or the benefit period. Two different household type settings are accounted for:

[1] The original 18 countries in CWED were: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States. CWED 2 adds at information on five countries which were included in the calculation of the generosity indices discussed here: Greece, Korea, Portugal, Spain and Taiwan. CWED 2 also includes more limited information on 10 Central and Eastern European countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

- Single: 100% earnings, living alone, no children or other dependents
- Family: 100% earnings, cohabiting with a dependent spouse with no earnings, two children aged 7 and 12

As the "typical" beneficiary of social insurance benefits is becoming more and more diverse in the post-industrial era (Scruggs 2013; Danforth and Stephens 2013), additional replacement rates for several different household types and income classes will be available soon.

Replacement rates are calculated by annualizing the benefit for an initial six month spell of unemployment, illness or pension beneficiary (i.e., calculating the benefit for the first 26 weeks and multiplying this by 2). The reference wage for calculating replacement rates is the "average production worker wage". Cash transfers from general government are accounted for when calculating the net wage. The reference income in work thus includes all cash transfers from general government (in most cases child/family benefits). This is the "take-home pay" as defined in OECD Taxing Wages (*reference OECD*). The replacement rate for families refers to the available household income including child and/or family benefits.

Decommodification and Generosity Indices in Three Worlds of Welfare Capitalism and CWED 1

The CWED project has generally tried to refer to its indicators as "generosity" scores, as opposed to "decommodification" scores, as in Esping-Andersen's (1990) decommodification index. The reasons are twofold. The first reason for using "generosity" instead of "decommodification" is to distinguish the results from Esping-Andersen's widely-cited measure. Though conceptually similar, CWED represents substantial improvements in consistency and historical and geographical coverage.

Second, we prefer the term "generosity" because it more accurately describes what is actually being measured in the decommodification index. With one exception (i.e., social pension replacement rates), all of the characteristics in Esping-Andersen describe provisions of social insurance that require varying periods of wage employment (i.e., employment).[2] Decent social insurance does buffer individuals from short-term wage dependence, and are explicitly recognized human rights (Scruggs, Zimmermann and

[2] The concept has been criticized for requiring labor commodification, and excluding many (e.g., female home workers) from meaningful social protection (e.g., Orloff 1993)

Jeffords 2013). Critically, however, the components of Esping-Andersen's decommodification index (and CWED) do not capture national guaranteed social minima.

Esping-Andersen's decommodification index. While there are many ways one could aggregate the social insurance characteristics that are scored in our program generosity score, the index described here is modeled on a methodology originally used to generate the generosity index in the original CWED project (Scruggs 2007). That index was, in turn, modeled closely on the decommodification scores developed in Gosta-Esping-Andersen's *Three Worlds of Welfare Capitalism* (1990).

In Esping-Andersen's methodology, three social insurance program areas— unemployment, sickness, and pensions—were scored on a number of characteristic indicators, including benefit replacement rates, duration and qualifying conditions, and program coverage. The characteristics are scored based on national program provisions. Each separate characteristic indicator was assigned a score of 1 (less generous), 2, or 3 (most generous) based on their deviation from the mean characteristic score in 18 advanced industrial democracies. The 18 countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, (West) Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and Untied States. Characteristic scores in each program were summed, with the benefit replacement rate weighted twice. The resulting sums were then multiplied by the population coverage ratio for the program to produce separate unemployment, sickness and pension sub-indices. These three sub-indices were summed to create Esping-Andersen's decommodification index. The decommodification index has been used extensively both as a heuristic for classifying the welfare states of advanced democracies, and as a cardinal measure of generosity in countless empirical analyses (see Scruggs 2007 for a list of several prominent studies using the original index in empirical work).

CWED 1: From decommodification to generosity. The goal of the Comparative Welfare Entitlements project has been to replicate and provide time-varying indicators of the decommodification index. As noted, the scores from *Three Worlds* are based on characteristics values for a single year: circa 1980. A methodological goal in creating the original CWED 1 generosity index was to compile scores that varied across space and time, but were comparable across countries and time. To do this, we created z-scores for each country year characteristic, normed on the cross-sectional mean and standard deviation in 1980, the same base year Esping-Andersen used.

$$(\text{Value}_{knt} - \text{meanValue}_{1980}) / \text{Sd}_{1980} \qquad (1)$$

where k= program characteristic, n= country, and t = year

The use of 1980 as a base year is ultimately arbitrary, but permitted us to evaluate levels and changes relative to Esping-Andersen's indicators.[3]

It is important to point out that the CWED 1 generosity scores differ from Esping-Andersen's scores for 1980 for three reasons. These reasons are explained in more detail in Scruggs and Allan 2006.

1. The 1980 data used in Esping-Andersen's indicators were part of the Social Citizenship Indicators Project (Korpi and Palme 2007), which was not publicly available until 2007. The CWED collected and coded all characteristics, thus replicating underlying data collection process.
2. CWED 1 used z-scores for country-characteristics scores, not the discrete values —i.e., 1, 2, or 3--used in the original decommodification index. This change resulted in scoring differences even when the underlying program characteristic data was the same in *Three Worlds* and CWED 1.
3. Though it is impossible to confirm definitively due to non-availability of the underlying data used to create the decommodification index, coding rules stated in *Three Worlds* were not always strictly adhered to.

Thus, while CWED 1's and Esping-Andersen's decommodification scores in 1980 should in principle have been very similar to each other, they also differed in important ways.

From CWED 1 to CWED 2. The CWED 2 generosity measure is based on the same logic as the CWED 1 version, but it does deviate in several important details. First, like CWED 1 country characteristic scores are based on z-scores with mean and distribution based on a base period. (As in the previous version, extreme values, including unlimited benefit duration are dropped and assigned a maximum or minimum z-score.) Also like CWED 1, characteristics z-scores for each program (unemployment, sick pay, public pension) are summed and the sum is multiplied by the coverage ratio (for unemployment and sickness), and take-up rate (for public pensions). However, several modifications improve the measure and allow us to incorporate scoring for more countries.

[3] Scoring in each year based on that particular year's mean and standard deviation would limit comparability across space and time. We were interested in explaining overall changes relative to the base period.

1. All calculations are based on a revised and updated data set of social insurance program characteristics. These measures are available as the Comparative Welfare Entitlements Dataset 2 (CWED2). CWED 2 includes information about social insurance program in five additional countries (Taiwan, South Korea, Spain, Greece, and Portugal) through the year 2010 (rather than 2002).[4]
2. Z-scores for several program characteristics were based on logged values. (Zero values are scored zero.) This transformation was used because the non-zero values of these characteristics follow a log normal distribution.
3. Rather than compute all z-scores based on the mean and standard deviations in 1980, we used all available observations for each characteristic to compute the mean and standard deviation. That is, we substitute Equation 2 for Equation 1. The rationale for using all variation, instead of variation in one arbitrary year is that there is considerable variation in characteristic scores over time in many countries. Failing to include cross-temporal variation across time is contrary to the purpose of using observed variation in "norming" countries.

$$(\text{Value}_{knt} - \text{meanValue}_{knt}) / \text{Sd}_{knt} \qquad (2)$$

4. The calculation of the pension generosity sub-index includes a new program characteristic which captures expected benefit duration. This is measured as the average of male and female life expectancy at age 65 plus the difference between the official retirement age and age 65. CWED 1 (and Esping-Andersen) considered net replacement rates for a) standard career public pension, and b) minimal old age pension; c) the years of work/contribution years needed to qualify for the standard pension in a); and d) the employee share of pension financing from wages. (For example, if the employer and employee were taxed at the same rate on paid wages, as in the United States, the ratio is 50.) Conceptually, the expected duration of pensions provides a complement to the benefit duration measured for sick pay and unemployment insurance. The expected duration of the pension benefits is an extremely large element in the wage-income nexus. The same pension replacement rate paid over 15 years is much less generous as the same benefit paid over 20 years.

[4] CWED 2 also contains information for several social insurance programs in the European Union accession countries. *They are not included in the calculations reported and discussed in this paper*, because all program features are not available for these countries.

The sub-index for unemployment and sick pay insurance is thus computed using the standardized (z-scores) values as:

$$\text{(Program generosity score)}_{knt} = [2*z(\text{Benefit Replacement rate}_{knt}) + z(\ln(\text{Benefit Duration weeks}_{knt})) + z(\ln(\text{Benefit Qualification weeks}_{knt}) + z(\text{Waiting days}_{knt}) + 12.5] * \text{Insurance Coverage}_{knt}$$

Z() indicates the z-score of the expression, benefit replacement rate is the average replacement rate for a single person and a family with one earner and two children. Benefit Duration is the standard maximum weeks of benefit for the notional employee; qualifying period is weeks of employment needed to qualify for benefit (of specified duration); waiting days is the number of days prior to unemployment or illness onset that a person must wait before social benefits start; and, 12.5 is added to make the sum in brackets take a minimum value of 0. Coverage is the share of the labor force insured for benefits;

The pension generosity sub-index is calculated as

$$\text{(Pension generosity score)}_{knt} = [z(\text{Standard Pension Benefit Replacement rate}_{knt}) + z(\text{Social Pension Benefit Replacement rate}_{knt}) + z(\text{Expected Pension Duration years}_{knt}) + z(\text{Standard Pension Qualification years}_{knt}) + z(\text{Employee pension funding ratio}_{knt}) + 12.5] * \text{Pension take-up rate}_{knt}$$

Standard replacement rate is the average for a single person and couple with one earner, the social pension replacement rate is the average for a single person and couple with no credited earnings. Pension duration is the life expectancy at retirement; pension qualifying years is the number of years of insurance needed for a standard pension; the funding ratio is the proportion of employee to (employee plus employer) contributions for the pension, and 12.5 is added to make the sum in brackets take a minimum value of 0. Pension take up is an estimate of the portion of those above retirement age who are in receipt of a public pension.

An overall generosity index is calculated as the sum of the sub-indices. The Stata code for converting the original CWED 2 data to generosity indices is available in the Appendix to this paper. The new generosity index and sub-index values are available at CWED2 website.

Descriptive Summary of Benefit Generosity in CWED 2

Figure 1 illustrates the average generosity score using the revised methodology for unemployment insurance, sick pay and pensions. The series represent the annual average generosity among the 18 countries used in much of the comparative literature. Recall the lines represent the average annual program generosity scores in the 18 advanced democracies used in *Three Worlds.* Most immediately apparent is that program generosity appears to increase until the early 1980s. Second, pension generosity and unemployment and sick pay generosity diverge over time. Pension generosity trends up through the period, especially in through the mid-1980s and again from the late 1990s. Unemployment and sick pay benefits are flat or declining; in particular, average unemployment benefit generosity falls substantially after 2002. The diverging trends underscore reflect an increasing elderly bias in social insurance spending (Lynch 2006). Our pension scores are based on the structure of benefits for a new retiree in the specified year, and not spending levels, so this "bias" reflects more than simply aging population structures.

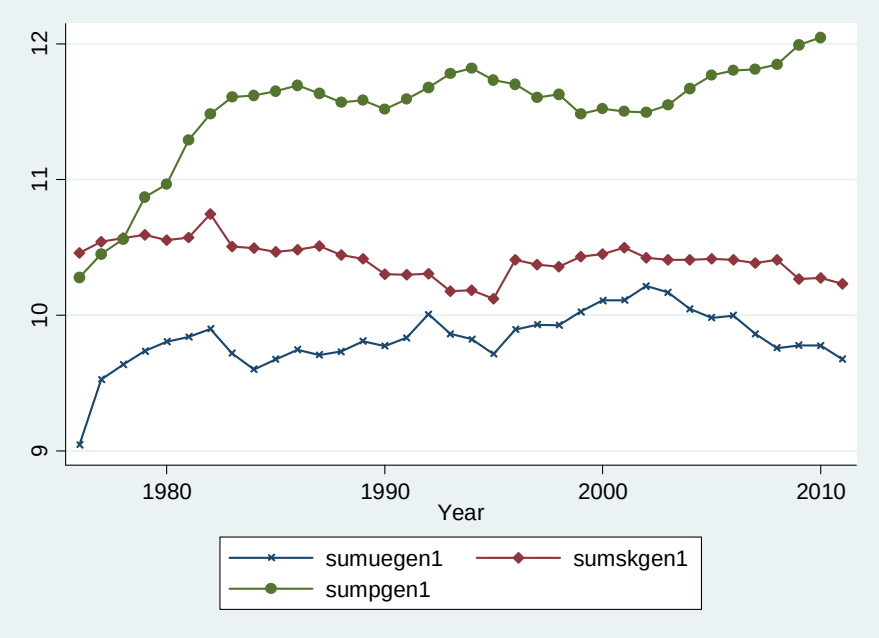

Figure 1: Social Insurance Generosity Scores 1975-2010

The generosity of *unemployment benefits* follows an upward trajectory until around 2002 after which it begins to decline. Over the last 20 years or so, large declines in generosity follow a few years after major national economic recession: mid 1980s, mid 1990s, and 2003. If this pattern repeats itself subsequent to the Great Recession, we could expect to see further reductions in benefit generosity in the next few years as economies (and wages) recover. *Sickness benefits* appear to have shrunk slowly over the last 35 year or so. Nonetheless, benefits tend to remain noticeably more generous than overall than unemployment benefits in many countries.

The increase in pension generosity over time, especially in the 1970s and 1980s, can be attributed to the maturation of public pension systems. Maturation refers to the process by which more people complete their full work career covered by the public pension system. For example, say a pension system is initiated in 1950. Workers earn 1% of their lifetime wage for each year of coverage up to 45 years (a full career). In 1980, the most someone could claim from the system is 30% of their wage, because they could only accrue entitlements for 30 years. By 1995, this person, assuming they earned credits in each year between 1980 and 1995, would earn 45% of their average wage.

Another factor producing the upward trend in pension benefits is the steadily increasing life expectancy at age 65. Pension ages have also increased in recent years (or will in the near future), but these are far outstripped by life expectancy.

It is important to include an important caveat about the upward trajectory of pension entitlements in Figure 1. As a rule, reductions in pension benefits take effect more slowly than do changes in programs targeted at unemployed or sick. For example, if the governments cut unemployment benefit replacement rate by 3 points (say, from 60% to 57%), the effects show up within months, or a year or so. For pensions, such cuts are generally applied on future work years. For example, the government might reduce the full pension replacement rate from 45% to 40% by cutting the annual accrual rate from 1% per year of covered employment to .88% for each year after the law is changed. The effect on someone retiring a year after the reform experiences only a minimal cut in benefits: from 45% to 44.9% (i.e., 45*.01 versus 44*.01 + 1*.0089), two years after: 44.8% (i.e., 44*.01+2*.0089), etc. The full effect takes 45 years to be realized. The implication of this fact is that the trends for pension generosity may not reflect long lead-in reforms. Some of these changes to generosity, such as the Swedish pension reforms, will likely be quite large.

One could also argue that it is misleading to average across countries with very diverse levels of generosity. Indeed, some scholars have argued that generosity trends may be going in different directions (Swank 2005).

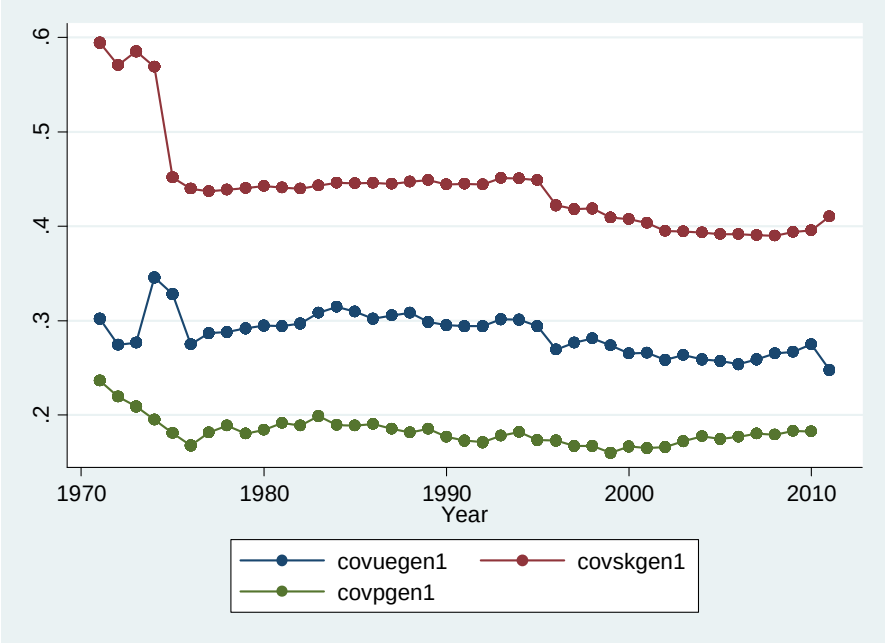

Figure 2: Coefficient of variation for social insurance programs in 18 advanced industrial countries.

Figure 2 illustrates one summary test of the cross-national variance in generosity scores. It does not suggest any divergence in program generosity over time. In fact, Figure 2 suggests a lot of program convergence in the late 1970s, and, since then, a very slow gradual trend toward even more convergence for unemployment and sickness benefits, and secular stagnation for pension benefits.

Comparing CWED 2 and CWED 1 Generosity Scores

Figures 3-5 provide over time comparisons between CWED 1 and CWED 2 scores. CWED 1 information is calculated only through 2002, so there is only partial overlap. CWED 2 measures in some cases correct some errors in the calculation of benefits. As these figures suggest, CWED 2 generosity scores are *not*

directly comparable to the CWED 1 scores. While CWED 2 does correct several coding errors present in the CWED 1 data (see Scruggs 2013), absolute score differences between CWED 1 and CWED 2 are generally *not* due to coding errors in CWED 1, but to the revised methodology for creating the index: e.g., benchmarking on more country-years, logging of some characteristic values before standardizing, , adding expected pension duration, and so forth.

Figure 3 suggests that the general trajectory of *unemployment benefit generosity* in the CWED 2 scores is similar to what we found in CWED 1. There is a sharp increase in generosity in the late 1970s, slight increases through the turn of the century with some slightly greater cycling, with local peaks in the recessions of early 1980s, early 1990s and early 2000s. (To reiterate, the scoring methodology, *not changes in the underlying program data*, explain the much higher average scores across the two measures.

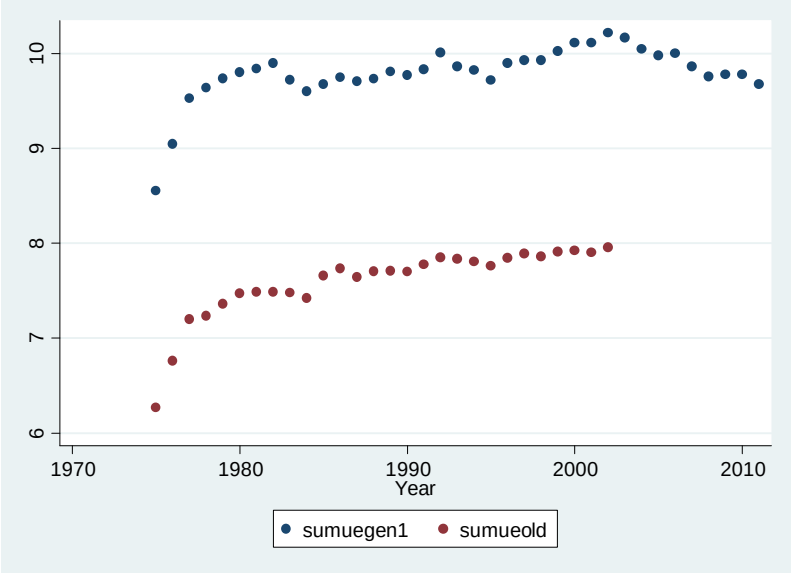

Figure 3: Unemployment generosity scores in CWED 1 (lower) and CWED 2 (upper)

Note: The large difference in levels between CWED1 and CWED2 are due primarily to changes in the methodology and not changes in the underlying program data.

Figure 4 shows the results for average *sick pay program generosity* scores in CWED 1 and CWED 2. These data suggest some differences in trend over time. Both show increases in average generosity until the early 1980s, but the CWED 2 results suggest a less dramatic average decline between the early

1980s and early 2000s; moreover, the CWED 2 data suggest that generosity leveled off and improved after the late 1990s. The precise drivers of this difference require further investigation.

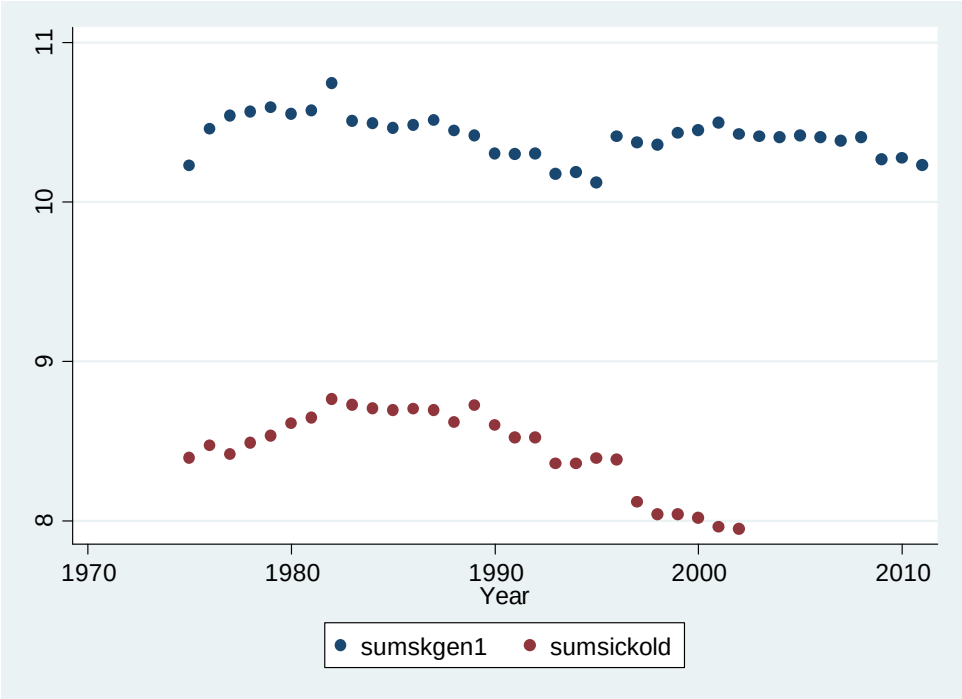

Figure 4: Sickness generosity scores in CWED 1 (lower) and CWED 2 (upper)

Note: The large difference in levels between CWED1 and CWED2 are due to changes in the methodology and not due to changes I the underlying program data.

Finally, *Figure 5* provides the average *pension generosity scores* for CWED1 and CWED2. The two indices show a considerable increase in generosity through the early 1980s. While CWED1 data suggests declining, but cyclically volatile, generosity in the 1980s and 1990s, CWED2 scores show much more stability, and less fluctuation during the 1980s and 1990s. One explanation for the lower volatility is no doubt the inclusion of expected pension duration, since it is subject to very little cyclical fluctuation in countries. It is also possible that the index is less volatile because there is higher computed variance in the underlying data due to CWED twos inclusion of a wider range of countries in computing the performance benchmarks.

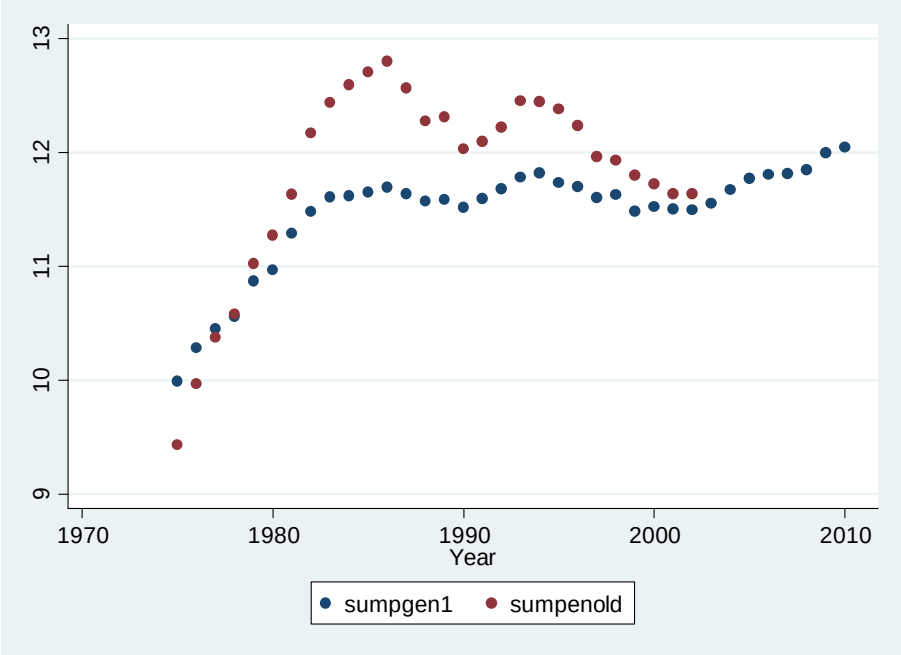

Figure 5: Pension generosity scores in CWED 1 (red) and CWED 2 (blue)

Note: The large difference in levels between CWED1 and CWED2 are due to changes in the methodology and not due to changes I the underlying program data.

Conclusion

Over the last two decades, scholars have made considerable progress in developing comparative indicators of the scope and generosity of social policy. The Comparative Welfare Entitlements Dataset represents one of several systematic efforts to provide comparable information about national welfare programs around the world. The program generosity scores generated with the CWED 2 dataset provide a basis by which scholars can systematically compare institutional provisions of national social insurance policies across countries and time over 40 decades. Methodological improvements in CWED 2 extend both the number of countries covered and capture the impacts of reforms into the second decade of the 21st century. These indices promise to be of considerable valuable for scholars of comparative social policy, public policy and political economy.

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Appendix: Code for creation of the CWED 2 program generosity indices

```
/** THIS PROGRAM IS FOR GENERATING GENEROSITY INDICES WITH CWED2 DATA */
/** Author: Lyle Scruggs, Professor, Department of POlitical Science, University of Connecticut*/
/** December 10, 2013*/

/*CWED 2 GENEROSITY SCORES
This method of generating generosity scores differs in important respects from earlier versions
of the measure.
1. Several indicators are standardized on logged values.
2. The pension score adds expected pension duration -- a measure of life expectancy at 65,
+/- retirement age difference from 65.
3. Top/bottom coding is at 2.5 sds rather than 3.
                                        */
/*  This section scores based on the mean and sd for years 1980-2007; it uses the cwedpost file opened
   in master1, and requires the following few remarked out lines to get usable data*/

      insheet using "C:\~\cwed2post1.1.csv"
      drop if ccode>23
      destring us100, replace
      destring uc1000, replace
      sort country year

*Creates Expected Pension Duration (Expected Life Years at retirement age)
      gen pendurexp=(65-(mret+fret)/2)+lexp65

*Recode missing data with the previous year if available
for var uecov sickcov: replace X=X[_n-1] if X==. & year<2012 & country==country[_n-1]

*Generates average of single 100 and couple 100/0 for UE, Sick and Pension programs
      gen ue100avg=(us100+uc100)/2
      gen sick100avg=(ss100+sc100)/2
      gen pen100avg=(sps100+spc100)/2
      gen mpen100avg=(mps100+mpc100)/2
* Recodes coverage greater than 1.00 to 1
for var uecov sickcov pencov: replace X =1 if X>1 & X<100

/* This section transforms and recodes some characteristics to use log values*/
*UE Qualifications
      gen luequal=ln(uequal)
      replace luequal=0 if uequal==0
      sum luequal if year>1979 & year<2008

*UE duration
      replace uedur=. if uedur==0
      gen luedur=ln(uedur)
      sum luedur if year>1979 & year<2008 & uedur~=999

*There is no transform for uewait

*Sick qual
```

```
replace sickqual=. if ss100==. & sickqual==0
gen lsickqual=ln(sickqual)
replace lsickqual=0 if sickqual==0

*sickdur
gen lsickdur=ln(sickdur)

*pendur expectation is normally distributed

*pqual is bimodal (0 and 45)

*pfund is ok

**UE GENEROSITY
  *Generates the mean and sd of UE characteristics in years 1980-2007
sum ue100avg if year>1979 & year<2008
gen uerravg=r(mean) if year<2012 & ue100avg~=.
gen uerrsd= r(sd) if year<2012 & ue100avg~=.
sum luequal if year>1979 & year<2008
gen uelqualavg=r(mean) if year<2012 & luequal~=.
gen uelqualsd= r(sd) if year<2012 & luequal~=.
sum luedur if year>1979 & year<2008
gen uelnduravg=r(mean) if year<2012 & luedur~=.
gen uelndursd= r(sd) if year<2012 & luedur~=.
sum uewait if year>1979 & year<2008
gen uewaitavg=r(mean) if year<2012 & uewait~=.
gen uewaitsd= r(sd) if year<2012 & uewait~=.
replace pen100avg=1.1 if countryab=="GRC"

* Generates z-scores for characteristics; reverses valance for
* scores where high=less generous; and top/bottom codes at +/2.5 SD
gen uescorerr=(ue100avg-uerravg)/(uerrsd)
gen uescoredur=(luedur-uelnduravg)/(uelndursd)
gen uescorequal=(luequal-uelqualavg)*-1/(uelqualsd)
gen uescorewait=(uewait-uewaitavg)*-1/(uewaitsd)
for var uescorerr-uescorewait: replace X=-2.5 if X<-2.5 & X~=.
for var uescorerr-uescorewait: replace X=2.5 if X>2.5 & X~=.
for var uescorerr-uescorewait: replace X=-2.5 if (countryab=="KOR" & X==.) | (countryab=="TWN" & X==.)

**SICK PAY GENEROSITY
  *Generates the mean and sd of Sick pay characteristics in years 1980-2007
sum sick100avg if year>1979 & year<2008
gen skrravg=r(mean) if year<2012 & sick100avg~=.
gen skrrsd= r(sd) if year<2012 & sick100avg~=.
sum lsickqual if year>1979 & year<2008
gen sklqualavg=r(mean) if year<2012 & lsickqual~=.
gen sklqualsd= r(sd) if year<2012 & lsickqual~=.
sum lsickdur if year>1979 & year<2008
gen sklduravg=r(mean) if year<2012 & lsickdur~=.
gen skldursd= r(sd) if year<2012 & lsickdur~=.
sum sickwait if year>1979 & year<2008
gen skwaitavg=r(mean) if year<2012 & sickwait~=.
gen skwaitsd= r(sd) if year<2012 & sickwait~=.
```

```
 * Generates z-scores for characteristics; reverses valance for
 * scores where high=less generous; and top/bottom codes at +/2.5 SD
      gen skscorerr=(sick100avg-skrravg)/skrrsd
      gen skscoredur=(lsickdur-sklduravg)/skldursd
      gen skscorequal=(lsickqual-sklqualavg)*-1/sklqualsd
      gen skscorewait=(sickwait-skwaitavg)*-1/ skwaitsd
      for var skscorerr-skscorewait: replace X=-2.5 if X<-2.5 & X~=.
      for var skscorerr-skscorewait: replace X=2.5 if X>2.5 & X~=.

**PENSION GENEROSITY
   *Generates the mean and sd of Pension characteristics in years 1980-2007
      sum pen100avg if year>1979 & year<2008
      gen sprravg=r(mean) if year<2012 & pen100avg~=.
      gen sprrsd=r(sd) if year<2012 & pen100avg~=.
      sum mpen100avg if year>1979 & year<2008
      gen mprravg=r(mean) if year<2012 & mpen100avg~=.
      gen mprrsd=r(sd) if year<2012 & mpen100avg~=.
      sum pendurexp if year>1979 & year<2008
      gen spduravg=r(mean) if year<2012 & pendurexp~=.
      gen spdursd=r(sd) if year<2012 & pendurexp~=.
      sum pqual if year>1979 & year<2008
      gen spqualavg=r(mean) if year<2012 & pqual~=.
      gen spqualsd=r(sd) if year<2012 & pqual~=.
      sum pfund if year>1979 & year<2008
      gen spfundavg=r(mean) if year<2012 & pfund~=.
      gen spfundsd=r(sd) if year<2012 & pfund~=.

 * Generates z-scores for characteristics; reverses valance for
 * scores where high=less generous; and top/bottom codes at +/2.5 SD
      gen spscorerr=(pen100avg-sprravg)/sprrsd
      gen mpscorerr=(mpen100avg-mprravg)/mprrsd
      gen spscoredur=(pendurexp-spduravg)/ spdursd
      gen spscorequal=(pqual-spqualavg)*-1/ spqualsd
      gen spscorefund=(pfund-spfundavg)*-1/ spfundsd
      for var spscorerr-spscorefund: replace X=-2.5 if X<-2.5 & X~=.
      for var spscorerr-spscorefund: replace X=2.5 if X>2.5 & X~=.

 * conditionally replaces coverage in Australia and New Zealand sick pay and UE
replace uecov=.5 if country=="Australia" | country=="New Zealand"
replace sickcov=.5 if country=="Australia" | country=="New Zealand"

*FINAL PROGRAM GENEROSITY
gen uegenerosity=(uescorerr*2+ uescoredur + uescorequal+ uescorewait + 12.5)*uecov
gen skgenerosity=(skscorerr*2+ skscoredur + skscorequal+ skscorewait + 12.5)*sickcov
gen pgenerosity=(spscorerr+ mpscorerr + spscoredur + spscorequal+ spscorefund +12.5)
replace pgenerosity=pgenerosity*.5 if country=="Australia"
replace skgenerosity=0 if country=="United States" | country=="Korea"
gen generosity= uegenerosity+ skgenerosity+ pgenerosity

save "C:\~\cwed2genindex.dta", replace
```