CWEP
Comparative Welfare Entitlements Project

Comparative Welfare Entitlements Dataset

Documentation

Version 2022-01

Summary

This data set provides systematic data on institutional features of social insurance programs in 33 countries spanning much of the post-war period. Its purpose is to provide an essential complement to program spending data that is available from international sources like the OECD's Social Expenditure Database.

This codebook contains the details of the data set, providing information about different institutional features of national social insurance programs in 27 OECD and 6 non-OECD countries. General information is provided in separate sections of the codebook. Country-specific sources and notes are provided in the country chapters of the codebook.

General Notes-CWEP Update as of 01/21/2022

Data used to calculate indicators have been updated to the extent that they are available and data from the previous release of the dataset may differ from the current, definitive dataset described in this codebook. The following series have been updated for the period 1970-2018 for most OECD countries. *These changes include corrections and updates on previous versions of the dataset.*

Wage series have been updated using OECD Statistics *Taxing Wages Comparative Tables* (1970-2018) and *Taxing Wages* publications (1995-2018):

- Gross production worker wages
- Net production worker wages
- Family and child transfers

Reference series used to calculate coverage and take-up rates of unemployment, sickpay and pension programs have been updated using the OECD *Annual Labor Force Statistics* and *Historical Population Statistics*, 1970-2018:

- Aged Population
- Total Labor Force
- Total Employment
- Self-Employment
- Unemployed
- Public Employment

As a condition for using the data, we ask that researchers send a copy of any scholarly paper utilizing the data sets. Email or send to:

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Citation

Non-commercial use of the dataset is conditional only on citation. References to the data should be made as:

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References to the codebook should be made as:

Scruggs, Lyle. 2022. "Comparative Welfare Entitlements Project Data Set, Version 2022-01. Codebook." Available at: http://cwep.us/

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Data accuracy

We have tried to be as consistent and accurate with our procedures as possible. Inevitably in a project of this size, there may be errors. If you find one, please let us know. We will make regular updates to the dataset to make it as accurate as possible. Suspected errors can be reported to the author(s) at lyle.scruggs@uconn.edu and info@cwed2.org. Alternative contact information is provided above.

1 Basic information

1.1 Countries included in the dataset

Country Name	Country Code (ISO 3166-1 Alpha-3)	Country Code (ISO 3166-1 Numeric)	CCODE (compatible to CWED I)	Start Year[1]	End Year
Australia	AUS	36	1	1971	2019
Austria	AUT	40	2	1972	2019
Belgium	BEL	56	3	1974	2019
Bulgaria	BGR	100	24	1995	2010
Canada	CAN	124	4	1972	2019
Czech Republic	CZE	203	25	1995	2010
Denmark	DNK	208	5	1971	2019
Estonia	EST	233	26	1995	2010
Finland	FIN	246	6	1971	2019
France	FRA	250	7	1974	2019
Germany	DEU	276	8	1972	2019
Greece	GRC	300	19	1979	2019
Hungary	HUN	348	27	1994	2010
Ireland	IRL	372	9	1971	2019
Italy	ITA	380	10	1971	2019
Japan	JPN	392	11	1971	2019
Korea	KOR	410	22	1996	2019
Latvia	LVA	428	28	1995	2010
Lithuania	LTU	440	29	1995	2010
Netherlands	NLD	528	12	1975	2019
New Zealand	NZL	554	13	1971	2019
Norway	NOR	578	14	1971	2019
Poland	POL	616	30	1995	2010
Portugal	PRT	620	21	1975	2019
Romania	ROU	642	31	1995	2010
Slovakia	SVK	703	32	1995	2010
Slovenia	SVN	705	33	1995	2010
Spain	ESP	724	20	1972	2019
Sweden	SWE	752	15	1971	2019
Switzerland	CHE	756	16	1974	2019
Taiwan	TWN	156	23	1999	2011
United Kingdom	GBR	826	17	1971	2019
United States	USA	840	18	1970	2019

[1] Refers to the first year we can estimate unemployment replacement rates.

1.2 Programs

The dataset and codebook contain information for 3 social insurance programs: Unemployment Insurance, Sickpay Insurance, and Public Pensions.
Note: We are currently collecting data on Child and Maternity Benefits and will update the dataset and codebook as these become available.

1. *Unemployment Insurance*

   This covers only national insurance provisions earned without income testing. It excludes unemployment assistance in Germany, for example, or income-based Jobseeker's Allowance in the UK; and it excludes any provisions for unemployment under collective bargaining contract. Exceptions: First, for full Ghent unemployment benefit systems (Denmark, Sweden, and Finland), benefits conditions that are coded technically include voluntary funds. Second, New Zealand and Australia have only means-tested benefits for unemployment and sickpay and are coded as if the full benefit is paid without qualifying condition or benefit limit.
   Note: For the United States, we are currently collecting state-level program characteristics and will update the dataset and codebook as these become available.

2. *Sickpay Insurance*

   Sickpay insurance is benefits paid in the event of short-term non-occupational illness or injury. This includes provisions for mandatory employer-paid benefits in addition to the public insurance regime, where the policy requires such provisions. We do not include collectively bargained top-ups in our calculations.
   Exceptions: For New Zealnd and Australia, the sickpay system mirrors the unemployment benefit system, and is means-tested with no limits on duration. We still code those benefits as if they were social insurance. In Switzerland, it includes sickpay benefits generally provided under labor law, even though there is no specific national sickpay legislation. (Users should be aware of these exceptions in using the data for their own analysis.)

3. *Public Pensions*

   The main pension schemes considered here include mandatory public programs and exclude occupational pensions, except for the nominally private Finnish earnings-related fund. We have included preliminary figures for occupational pensions in France and Switzerland, and other cases will be included in future iterations of the dataset. Besides earnings-related mandatory public pensions, data is also provided on replacement rates of minimum pensions, that is, for persons without an earnings history. In many cases this is referred to as the "social pension."

1.3 Time period

For most of the OECD countries data on replacement rates, qualifying conditions and take-up or coverage rates are provided for 1970-2018. For Central and Eastern European countries, and Taiwan, data is generally available for a shorter period (1995-2010).
Note: We are currently collecting data for Central and Eastern European countries andTaiwan and will update the dataset and codebook as these become available.

1.4 Common sources

Benefit determination is based on/verified in national sources where possible as stipulated in the individual country entries of the codebook. However, the following sources were widely used for all countries:

- Social Security Administration. Various years. *Social Security Programs Throughout the World*. Washington, DC: Government Printing Office
  The on-going (bi-annually) periodical has been published since 1937 in cooperation with the International Social Security Association (ISSA). Earlier years appeared in print, while current data is published online at:
  http://www.ssa.gov/policy/docs/progdesc/ssptw/
  https://ww1.issa.int/country-profiles

- European Commission. Various years. *Mutual Information System for Social Protection (MISSOC). Comparative Tables on Social Protection.* Luxembourg: Office for Official Publications of the European Communities.
  http://www.missoc.org/

- European Commission. 2002. *Mutual Information System for Social Protection in the Central and Eastern European Countries (MISSCEEC).*
  https://ec.europa.eu/employment_social/missceec/index_en.html

- Council of Europe. Various years. *Mutual Information System on Social Protection of the Council of Europe (MISSCEO).* Strasbourg: Council of Europe Publishing.
  MISSOC contains detailed institutional information for European Union and European Economic Area countries, starting in 1961 (then called *Comparative tables of the social security schemes in the member states of the European Communities*). The basic scheme was applied to the Central and Eastern European countries within the MISSCEO framework and the MISCEEC project.
  https://www.coe.int/en/web/european-social-charter/missceo-database

- OECD. Various years. *Taxing Wages.* Paris: OECD Publishing.
  Previously titled *Tax/Benefit Position of Employees*, *Tax /Benefit Position of a Typical Worker*, and *Tax/Benefit Position of a Production Worker*, since the early 1970s this publication provides the baseline for reference earnings, social charges, and income tax structure used in computing net wages and net replacement rates.
  https://www.oecd.org/tax/taxing-wages-20725124.htm

- OECD. Various years. *Benefits and Wages.* Paris: OECD Publishing.
  Benefits and Wages contains specific information on unemployment insurance and income taxation. The more recent files are available as digital copies at the OECD iLibrary (http://www.oecd-ilibrary.org) or at:
  https://www.oecd.org/social/benefits-and-wages/

- OECD. Various years. *Labor Force Statistics.* Paris: OECD Publishing.
  This on-line database corresponds closely with the traditionally published *Labor Force Statistics* periodical. This source is used almost exclusively for statistics on labor force, population 15 to 64, population aged 65 years and over, self-employed,

unemployed, total population, unpaid family labor and retirement age labor force. Both are available via the OECD iLibrary (http://www.oecd-ilibrary.org) and https://www.oecd.org/sdd/labour-stats/

- IBFD. Various years. *European Tax Handbooks.* Amsterdam: IBFD Publications.

- IBFD. Various years. *Central & East European Tax Directory.* Amsterdam: IBFD Publications. Since the 1990s these series provide detailed data on tax rules and social charges for both companies and individuals in a comparative manner. They formed the basis for calculating net wages for non-OECD countries not covered in *Taxing Wages*.

1.5 Variables

Variable Name	Description
COUNTRY	Country name
COUNTRY ABBREV	Country code (ISO 3166-1 Alpha-3)
ISOCODE	Country code (ISO 3166-1 Numeric)
CCODE	Country code (compatible with CWED I)
YEAR	Year of observation
	Welfare Generosity Indices
TOT_GEN[2]	Combined Generosity Index
UE_GEN[1]	Unemployment Generosity Index
SK_GEN[1]	Sickpay Generosity Index
P_GEN[1]	Pension Generosity Index
	Production Worker Wage and Average Tax Rate[3]
GW_S50	Gross production worker wage: Single (50%)
GW_S100	Gross production worker wage: Single (100%)
GW_S150	Gross production worker wage: Single (150%)
GW_S200	Gross production worker wage: Single (200%)
GW_SP50	Gross production worker wage: Single Parent (50%), 2 children
GW_SP100	Gross production worker wage: Single Parent (100%), 2 children
GW_C1000	Gross production worker wage: Couple (100-0%), 1 earner, 2 children
GW_C5050	Gross production worker wage: Couple (50-50%), 2 earners, 2 children
GW_C10050	Gross production worker wage: Couple (100-50%), 2 earners, 2 children
GW_C150150	Gross production worker wage: Couple (150-150%), 2 earners, 2 children
NW_S50	Net production worker wage: Single (50%)
NW_S100	Net production worker wage: Single (100%)
NW_S150	Net production worker wage: Single (150%)
NW_S200	Net production worker wage: Single (200%)
NW_SP50	Net production worker wage: Single Parent (50%), 2 children
NW_SP100	Net production worker wage: Single Parent (100%), 2 children
NW_C1000	Net production worker wage: Couple (100-0%), 1 earner, 2 children

[2] The generosity index methodology is explained in Lyle Scruggs (2014) “Social Welfare Generosity Scores in CWED 2: A Methodological Genealogy”, CWED Working Paper #1, available on the CWED website. The methodology and scaling differ in important ways from the original generosity index in the previous CWED project.
[3] The percentage amounts enclosed in parentheses (50%, 100%, 150%, 200%) refer to the fraction of the average wage that is represented in the variable. For couples we provide the percentage amount corresponding to each earner in the household (100-0%, 50-50%, 100-50%, 150-150%).

NW_C5050	Net production worker wage: Couple (50-50%), 2 earners, 2 children
NW_C10050	Net production worker wage: Couple (100-50%), 2 earners, 2 children
NW_C150150	Net production worker wage: Couple (150-150%), 2 earners, 2 children
TAX_S50	Average tax rate: Single (50%)
TAX_S100	Average tax rate: Single (100%)
TAX_S150	Average tax rate: Single (150%)
TAX_S200	Average tax rate: Single (200%)
TAX_SP50	Average tax rate: Single Parent (50%), 2 children
TAX_SP100	Average tax rate: Single Parent (100%), 2 children
TAX_C1000	Average tax rate: Couple (100-0%), 1 earner, 2 children
TAX_C5050	Average tax rate: Couple (50-50%), 2 earners, 2 children
TAX_C10050	Average tax rate: Couple (100-50%), 2 earners, 2 children
TAX_C150150	Average tax rate: Couple (150-150%), 2 earners, 2 children
	Unemployment Insurance
UE_RR_S50	Replacement rate: Single (50%)
UE_RR_S100	Replacement rate: Single (100%)
UE_RR_S150	Replacement rate: Single (150%)
UE_RR_S200	Replacement rate: Single (200%)
UE_RR_SP50	Replacement rate: Single Parent (50%), 2 children
UE_RR_SP100	Replacement rate: Single Parent (100%), 2 children
UE_RR_C1000	Replacement rate: Couple (100-0%), 1 earner, 2 children
UE_RR_C5050	Replacement rate: Couple (50-50%), 2 earners, 2 children
UE_RR_C10050	Replacement rate: Couple (100-50%), 2 earners, 2 children
UE_RR_C150150	Replacement rate: Couple (150-150%), 2 earners, 2 children
UE_QUAL_40	Qualification period: Weeks of insurance needed to qualify for benefit (40/20)
UE_QUAL_25	Qualification period: Weeks of insurance needed to qualify for benefit (25/2)
UE_DUR_40	Duration: Weeks of benefit entitlement (40/20)
UE_DUR_25	Duration: Weeks of benefit entitlement (25/2)
UE_WAIT	Waiting days: Number of days one must wait to start receiving benefit after becoming unemployed
UE_COV	Coverage: Percentage of the labor force insured for unemployment risk[4]
	Sickpay Insurance
SK_RR_S50	Replacement rate: Single (50%)
SK_RR_S100	Replacement rate: Single (100%)
SK_RR_S150	Replacement rate: Single (150%)
SK_RR_S200	Replacement rate: Single (200%)
SK_RR_SP50	Replacement rate: Single Parent (50%), 2 children
SK_RR_SP100	Replacement rate: Single Parent (100%), 2 children
SK_RR_C1000	Replacement rate: Couple (100-0%), 1 earner, 2 children
SK_RR_C5050	Replacement rate: Couple (50-50%), 2 earners, 2 children
SK_RR_C10050	Replacement rate: Couple (100-50%), 2 earners, 2 children
SK_RR_C150150	Replacement rate: Couple (150-150%), 2 earners, 2 children
SK_QUAL_40	Qualification period: Weeks of insurance needed to qualify for benefit (40/20)
SK_QUAL_25	Qualification period: Weeks of insurance needed to qualify for benefit (25/2)
SK_DUR_40	Duration: Weeks of benefit entitlement (40/20)
SK_DUR_25	Duration: Weeks of benefit entitlement (25/2)
SK_WAIT	Waiting days: Number of days one must wait to start receiving benefit after becoming sick

[4] This is *not* the percentage of currently unemployed/sick who are currently receiving benefits. It refers to the percentage of the labor force who are insured for benefits.

SK_COV	Coverage: Percentage of the labor force insured for sickpay[2]
	Minimum and Standard Public Pensions
MP_RR_S50	Replacement rate: Single (50%)
MP_RR_S100	Replacement rate: Single (100%)
MP_RR_S150	Replacement rate: Single (150%)
MP_RR_S200	Replacement rate: Single (200%)
MP_RR_SP50	Replacement rate: Single Parent (50%), 2 children
MP_RR_SP100	Replacement rate: Single Parent (100%), 2 children
MP_RR_C1000	Replacement rate: Couple (100-0%), 1 earner, 2 children
MP_RR_C5050	Replacement rate: Couple (50-50%), 2 earners, 2 children
MP_RR_C10050	Replacement rate: Couple (100-50%), 2 earners, 2 children
MP_RR_C150150	Replacement rate: Couple (150-150%), 2 earners, 2 children
SP_RR_S50	Replacement rate: Single (50%)
SP_RR_S100	Replacement rate: Single (100%)
SP_RR_S150	Replacement rate: Single (150%)
SP_RR_S200	Replacement rate: Single (200%)
SP_RR_SP50	Replacement rate: Single Parent (50%), 2 children
SP_RR_SP100	Replacement rate: Single Parent (100%), 2 children
SP_RR_C1000	Replacement rate: Couple (100-0%), 1 earner, 2 children
SP_RR_C5050	Replacement rate: Couple (50-50%), 2 earners, 2 children
SP_RR_C10050	Replacement rate: Couple (100-50%), 2 earners, 2 children
SP_RR_C150150	Replacement rate: Couple (150-150%), 2 earners, 2 children
SP2_RR_S50	Replacement rate (occup): Single (50%)
SP2_RR_S100	Replacement rate (occup): Single (100%)
SP2_RR_S150	Replacement rate (occup): Single (150%)
SP2_RR_S200	Replacement rate (occup): Single (200%)
SP2_RR_SP50	Replacement rate (occup): Single Parent (50%), 2 children
SP2_RR_SP100	Replacement rate (occup): Single Parent (100%), 2 children
SP2_RR_C1000	Replacement rate (occup): Couple (100-0%), 1 earner, 2 children
SP2_RR_C5050	Replacement rate (occup): Couple (50-50%), 2 earners, 2 children
SP2_RR_C10050	Replacement rate (occup): Couple (100-50%), 2 earners, 2 children
SP2_RR_C150150	Replacement rate (occup): Couple (150-150%), 2 earners, 2 children
SP_QUAL	Years of pension insurance to be "fully covered" for the standard pension benefit
SP_AVGPER	Years of earnings used in the pensionable wage calculation (e.g., best five years, best 20 years of revalued earnings) for the standard public pension benefit
PEN_COV	Coverage/Take-up: Portion of those above official retirement age who are in receipt of a public pension
MRET	Male retirement age
FRET	Female retirement age
LEXP65	Life expectancy at age 65, simple (unweighted) average for males and females[5]
PEN_DUR	Expected duration of pension benefits based on official retirement age and life expectancy at age 65
	Contribution Rates
SP_FUND	Worker pension contributions/employer plus worker pension contributions
PC_WORKER	Contribution rate paid by worker, old age pension
PC_EMPLOYER	Contribution rate paid by employers, old age pension
UEC_ WORKER	Contribution rate paid by worker, unemployment insurance
UEC_EMPLOYER	Contribution rate paid by employers, unemployment insurance
SICKC_ WORKER	Contribution rate paid by worker, sickpay

[5] These data come from *OECD Health Status: Life Expectancy* tables.

SICKC_EMPLOYER	Contribution rate paid by employers, sickpay
OTHC_ WORKER	Contribution rate paid by worker, other
OTHC_EMPLOYER	Contribution rate paid by employers, other

2 Conceptualization of the Comparative Welfare Entitlements Project

2.1 Basic conceptualization of CWEP

The basic conceptualizations of the variables are described in Scruggs (2007, 2014) and Allan and Scruggs (2004).[6] The early idea can be traced back to Esping-Andersen (1990) and the Social Citizenship Indicators Project (SCIP) associated with the Swedish Institute for Social Research (SOFI) (See Scruggs 2013 and other papers in the *Journal of European Public Policy* special symposium, and Bolukbasi 2017). A major purpose of these projects is to provide historical information on important characteristics of social welfare policies across a diverse range of advanced industrial countries.

In this current version, CWEP continues to provide updates and refinements to the original information about major social welfare programs in several important dimensions, particularly by including information about social welfare program "inequalities," that is, how social policies treat individuals and households with different wage and salary incomes in work. In this respect, we hope that CWEP can make possible a more comprehensive comparison of how social policies balance social goals of insurance and equality.

National Welfare Program Conditions and Benefits: Social welfare rights

Most countries around the world have some provision in national legislation to provide cash social benefits for its members. Most of these benefits take the form of social insurance: they ensure a certain amount of *replacement income* for a certain period (*duration*) based on certain *qualifying conditions* preceding the labor market "event" activating the program benefit (e.g., loss of a job, onset of an illness, or retirement from the labor market). Another vital feature of social programs is their *coverage* of the population, which can be thought of as an outcome condition of qualification.

For most major social welfare programs, the extent of individual replacement income and conditionality for national social benefits varies considerably across space and time. The value of program features, moreover, are frequently interrelated—benefit income is positive in income and some qualifying conditions, but only up to a point after which the benefit is constant. The rules in a particular program apply to all people in a particular country-year; but programs in different countries often resemble each other, and each may vary over time. Variation can be in the relative treatment of all, but changes may also shift across groups within a country over time: e.g., if maximum level of a program benefit is reduced, it directly affects only those previously receiving (or due) a benefit higher than the new maximum.

[6] These references refer to CWEP by its earlier name, Comparative Welfare Entitlements Dataset (CWED). In the codebook, we generally refer to CWED when talking about previous releases of the dataset (prior to 2020), and CWEP to refer to the current version, or to the overall trajectory of the project, past and present.

Since benefits differ in their payment level, duration, and qualification, determining common metrics of benefits raise several complications, like projects before it, CWEP provides information that can be cogently evaluated across space, time, and classes of individuals. CWEP collects program information on three main social insurance cash benefit programs—unemployment insurance, sickpay insurance and public pensions.
The upshot of the previous discussion is that once we wish to compare income replacement across countries or time (or both!), we require some constant set of assumptions, or "notional individuals" or households that are to be held constant across space and time in order to provide some comparability. First, we consider the labor market status and history; then we discuss income level and family structure; and in the case of pensions, we must also consider the income history.

Assumptions about Labor market status/history

In CWEP, when determining replacement rates for *unemployment* and *sickpay benefits*, we consider that the notional individual in all countries and years has one of the following two profiles, and associated history of any social contributions towards the respective unemployment or sickness program:

> a) 40 years old, and working for the 20 years preceding the start of the benefit period; or
> b) 25 years old and working for 2 years preceding the start of the benefit period.[7]

To some extent, the selection of these work experiences is, of course, arbitrary. In CWEP, the first notional worker can be thought of as referring to a more "established" worker. This profile was used in earlier versions of CWED and is used in related projects (like SCIP). The second notional worker is much younger and can be thought of as having more limited labor force participation. We included this profile because it better captures a person that is more of a labor market "outsider," i.e., a person with less labor market status (Schwander and Hauserman 2013).

For public pensions, we make one of two assumptions, depending on the program:

a) Standard pension- The person is retiring at a standard/legal retirement age (65 as the default), and their earnings history represents a 45-year career at the same relative wage (i.e., average, or half of average).[8] In the case of a couple, we assume the same for the spouse's age and income (that they are also at retirement age and had the same relative income for 45 prior years.)
b) Minimum/Social pension- The person was resident during their lifetime and made no contributions to a public pension fund; and they have no other source of income.[9]
Public pension benefits are generally paid upon retirement from the labor market determined by a combination of need (means-tested or social assistance pensions).

[7] In previous editions of CWED/P, the notional worker was 40 years old with 20 years of work experience.
[8] We use revaluation tables or rules to, where needed, revalue past earnings to estimate the initial standard pension benefits.
[9] There is an exception here in the case of a couple household where we assume that the work history was 0 for the secondary earner/spouse. They are evaluated (if relevant in the specific country and period examined) as if they live with the spouse with an earning history. (More often than not, this implies that they do not qualify for no social pension, based on the high income of the spouse)

Replacement Rates

Most social benefit programs (unemployment, sickpay, and standard pensions) vary benefits to individuals based on their previous wages. Most often, there is a benefit floor and ceiling with variation in between based on standard income. Importantly, since disposable income replacement is most relevant for comparing the effects of programs on individual well-being, taxation should be considered in comparisons of the benefit replacement rate. Replacement rates are thus conceived as the ratio of disposable (i.e., after tax/transfer) benefit income to disposable employment income.

$$\text{Replacement income} = (\text{benefit income}_{it} - \text{taxes on benefit income}_{it}) / (\text{work income}_{it} - \text{taxes on wage income}_{it})$$

A feature of interest in understanding the design of social policies is their role in promoting equality as well as insurance. Tax policies combined with the level of social benefit floors and ceilings impact the egalitarianism of the tax and benefit system. So does family structure. Some social benefit arrangements may be especially hard on families if taxes and benefits do not consider that labor market disruptions may have a larger negative social impact when they fall on families with children. CWEP addresses this need for assessing comparative social policy across income and family groups by providing notional replacement rates for programs across **ten** household types (up from 2 in the last version of CWED.)

Single earner, no children earning:

1) 50% of the average wage
2) 100% of the average wage
3) 150% of the average wage
4) 200% of the average wage

Single earner, 2 children (aged 7 and 12) earning:

5) 50% of the average wage
6) 100% of the average wage

Married couple, two children (ages 7 and 12) earning (individually and respectively):

7) 100%/0%
8) 50/50%
9) 100/50%
10) 150/150% of the average wage.[10]

In computing pension replacement rates for these household/wage types, net pension income (numerator) is computed without children (assumed to no longer live at home), but net wage (denominator) is for a working household with two children as specified.

For unemployment and sickness program replacement rate calculations are based on an "annualized" six-month benefit for a worker earning the reference wage of one of the 10 household/income types. To annualize, we use the total benefit for a six-month spell of unemployment or illness and multiply this by 2. Tax and social charge obligations are deducted, and any social transfers relevant to the household are added producing a "net benefit."

[10] Non-pension benefit calculations are made assuming that the wage of the principal earner loses their income, while the second earner does not.

The **reference wage** in calculating replacement rates is the 100% of the "average production worker wage" (i.e., work income), as defined in the OECD's *Taxing Wages* series. Income taxes and mandatory social contribution are deducted, and cash transfers from general government added, producing the **net wage** (NW). This relies on standard assumptions and corresponds to "take-home pay" in OECD *Taxing Wages*.

Since 2005, the OECD revised their reference wage to a broader concept called the "Average Worker" (AW) wage. (This included more information about service sector employment.[11]) Although this definition may come closer to an average worker and thus the average beneficiary today, after an assessment of the two series for several overlapping years, we opted to interpolate from the AW to continue the APW series (using AW wage growth and the APW 2004 base). In most cases, the development of AW and APW wages show similar growth rates:

$$\text{Extrapolated gross wage}_t = \text{APW}_{t-1} + (\text{APW}_{t-1} * \text{Growth Rate AW}_t)$$

In cases where no overlapping data on APW and AW was available (Bulgaria, Estonia, Latvia, Lithuania, Romania, and Slovakia) the average of the growth rates of APW_{t-1} and AW_{t+1} were used for the earliest time point (for a closer description of the method and comparability of the wage series (see Jahn, Kuitto and Düpont 2011).

Pension replacement rate computations apply the benefit rules in force for an individual retiring in the year being measured, using the estimated wage history of the APW wage series. Notably, unlike the OECD *Pension at a Glance* projections, our pension replacement rate relies on the realized set of pension entitlements. Thus, for the pension amount for a standard worker retiring in 1999, we use the wage history of a person (earning average wages) in each year of a 45-year career, i.e., back to 1953. If the pension rules governing pension contributions change during that period, we took that into account if we had information that such changes would apply to that worker. In the example, if pension contributions prior to, say, 1980, generated a more generous pension increment-- and that more generous rule applied to a person retiring in 1999-- our results should pick that up.[12]

We use the computed pension amount for the beginning of the year multiplied by the number of payments (usually 12, but in some pension regimes there is a 13th or 14th payment), deduct applicable taxes and social charges on public pension income, and divide that by the net wage for the associated household/wage type. As previously mentioned, for household types that include children, in computing pensions and net incomes, we assume that there are no children present in the numerator and include children in the equivalent wage-earner household (denominator).

[11] For the reasons and consequences of this change in definition, see the OECD special feature "Broadening the Definition of the Average Worker" (OECD 2005: 33-42).

[12] Pensions tend to have been scaled back over the last several decades. *Pensions at a Glance* 2009 computes a pension benefit in 2009 using the 2009 rules, and assuming those with be the same indefinitely into the future. I.e., they estimate what a new employee might earn for a pension at retirement in 40 years, rather than what a person retiring in 2009 earned.)

2.2 Coding instructions and assumptions

Gender:

- notional person/beneficiary: *male* (in case it matters)
- dependent spouse: *female* (same age and no employment history)
- working spouse: *female* (same age and employment history as notional person)

Lone parent assumption:

- Lone parent does *not* receive *alimony* from other parent (in line with OECD assumption)

Federalist States:

- OECD convention: e.g. Switzerland: Zurich, USA: Detroit
- Capital City

Qualifying period:

- Corresponds to insurance period necessary to receive the benefit accruing to one of the two notional worker types, i.e. the minimum contribution period to receive the length of benefit for a) age 40 with 20 years of contributions, or b) age 25 with 2 years of contributions.[13]
- If benefit qualification is based on earnings rather than simply a period of insurance), qualifications are assumed based on individual wages of 100% of the APW/AW. (This is obviously a simplification given the multiple earning levels considered in the dataset). For standard pension benefits the qualifying period refers to the number of years of pension insurance required for entitlement to a "full" pension benefit.

Duration:

- Weeks of benefit entitlement excluding times of means-tested assistance or long-term disability/invalidity pensions. For unemployment and sickpay benefits we code the maximum duration of benefits based on the two notional workerage and work profiles:
  - a) 40 years old and 20 years employment
  - b) 25 years old and 2 years employment
- For standard pension benefits the "expected duration of benefits" is based on the expected number of years a person would receive a pension. 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.

Waiting days:

- This refers to the number of days from the onset of unemployment, illness or leave that a worker must wait before being eligible to receive benefits. They are not considered when calculating the benefits (i.e. the benefit is calculated for the first 26 weeks in full after the waiting days).

[13] In many cases, the benefit duration for one of the two fictional workers (20 years or 2 years of contributions) can in fact be earned with less than the specified contribution period. In that case, we code the minimum insurance period to receive the benefit. For example, if an unemployment system entitles all workers with a year of contributions nine weeks of unemployment benefits, the qualifying period for both fictional workers should be coded 52 weeks.

Contribution Rates:

- For each program we have coded the "tax" rate of contributions paid by employees and employers, where available. In cases where only a global contribution is reported (i.e. one rate finances multiple benefit programs) we have provided this information in the "other" contribution category. "Other" contributions may also include additional social charges not specific to a benefit program (e.g. solidarity contributions) and are noted in the country-specific chapters of the codebook where they exist.

Unemployment:

Length of unemployment	First 6 months
Who is unemployed?	Only one person, i.e. the *principal earner* (even in the case of a couple)
Years of insurance	Worker 1: 40 years old and 20 years of insurance (but if worker qualifies for the longest benefit in only 10 years – or whatever the minimum is – then that is coded). Worker 2: 25 years old and 2 years of insurance
Worker type: White collar/blue collar?	Blue collar (same as above)
UE insurance type: Voluntary or involuntary	Involuntary (=mandatory)
Type of Worker: Full time/part time?	Full time
Type of Unemployment: Full/part?	Full benefit

Sickpay:

Length of Illness, i.e. duration of benefit payment	First 6 months
Years of Insurance	Worker 1: 40 years old and 20 years of insurance (but if worker qualifies for the longest benefit in only 10 years – or whatever the minimum is – then that is coded). Worker 2: 25 years old and 2 years of insurance
Worker type: White Collar/blue collar?	Blue collar
Illness type	Common cold/flu
Sickness insurance type	Involuntary (=mandatory)
Type of worker: Full time/part time?	Full time

Minimum Pension:

Years of insurance/contributions	0: Doesn't qualify for an earnings-related pension
Age	65 years old if retirement age is variable, or the legal retirement age
Worker Type: White Collar/blue collar?	———
Children	Two adult children (=non-dependent)
Spouse	Supplements included depending on household type
Income level	Assumes no other source of income is available
**Replacement Rate will be the same for countries that have flat rate pension and zero for countries without a minimum or social pension	

Standard Pension:	
Years of insurance/contributions	45 years of contributions and retiring at the legal retirement age (no early retirement)
Age	65 years old if retirement age is variable, or the legal retirement age
Worker Type: White Collar/blue collar?	Both cases
Children	Two adult children (=non-dependent)
Spouse	Supplements included depending on household type
Household types and earnings	According to wage class (50%, 100%, 150%, 200%) and marital status: Every year for their entire 45-year working life
Type of pension insurance	Public/mandatory ("first pillar")
Insurance qualification	Working 45 years prior to retirement

Standard Pension 2:	
Years of insurance/contributions	45 years of contributions and retiring at the legal retirement age (no early retirement)
Age	65 years old if retirement age is variable, or the legal retirement age
Worker Type: White Collar/blue collar?	Both cases
Children	Two adult children (=non-dependent)
Spouse	Supplements included depending on household type
Household types and earnings	According to wage class (50%, 100%, 150%, 200%) and marital status: Every year for their entire 45-year working life
Type of pension insurance	Occupational/Private Mandatory ("second pillar")
Insurance qualification	Working 45 years prior to retirement

3 Country-specific notes

This section contains additional details about specific calculations and sources for individual countries. Some of the country notes may contain references to two programs that are not yet available:

Australia

Wages
Wage series for 1972-1978, 1980, 1982 based on changes in the mfg. wage index in OECD series. Wages 1965-1972 from OECD mfg wage series. (Australian database gives only gender-segregated wages.) When OECD APW series ends in 2004, we use the rate of change in the AW and the APW base to estimate APW through 2017 (OECD Taxing Wages 2019 edition). (Unlike most countries, Australia's AW is lower than its APW.)
Update: There is a new Low and Middle Income Tax Offset introduced in 2019.

Unemployment, Sickpay, and Pension
Sources: The amounts for all three of these programs here are taken from official government sources, specifically: Department of Social Security, Guide to Social Security Law Tables (version 1.254, 6 May 2019 https://guides.dss.gov.au/guide-social-security-law/5/2) This source has historical rates and effective dates) from 1960s. Benefits generally are those in effect on April 1 of the year. Many benefits are adjusted twice a year for inflation. Additional years from *Social Security Programs Throughout the World.*
Australian system is flat rate, means-tested for UE, Sickpay, and Pension.

The family benefit amounts for sickness and unemployment benefits include the Family Tax Benefit from 1997 and FTB parts A& B from 2001. The compulsory superannuation system, thought nominally universal for employees since 1992, is not included in the computation of public pension benefits (or in the taxes of individuals).

Taxes
Per communication with Australian officials, if it is the only income, the above benefits are not taxed. Withdrawal and income limits for benefits are based on the Guide to Social Security Laws. Version 1.188 - Released 2 July 2012 http://guidesacts.fahcsia.gov.au/guides_acts/ssg/ssg-rn.html, updated with version 1.254, 6 May 2019 http://guides.dss.gov.au/guide-social-security-law/5/2/4/50)

Qualifying conditions
Benefits are income/means-tested. SSPTW and Australian sources.

Coverage
UE and Sickness: The entire labor force is considered eligible. Estimates of unemployment insurance recipients since the late 1970s in the table. It is based on *Income Support Customers- Statistical Overview* for 1999, 2000 and various more recent years.
Pension: Coverage is computed as the number of benefits paid over population above retirement age. There are three series. 1) Aus DFaCS, *Income Support Database* (on file) 2) Whiteford and Angenent (below) with data provided by Angenent. The series "% aged receiving SS payments" as this appears to include veterans' pensions. Data from 1901. From 2001 number of retirement pensions is from the Statistical Yearbooks and *Income Support Customers- Statistical Overview*. As of now, the coverage data excludes civil service pensions, which are a separate scheme.
Number of age pension recipients since 2010 is from the Australian Bureau of Statistics and the Department of Social Services.

https://www.abs.gov.au/
https://www.dss.gov.au/about-the-department/publications-articles/research-publications/statistical-paper-series
https://data.gov.au/data/dataset/dss-payment-demographic-data
Note: while the entire labor force and retired are considered covered, in calculating generosity scores we use a coverage rate of 0.5 to penalize the country score due to the means-tested nature of the programs.

Additional Sources:

Australian government *Guide to Social Policy Law: Social Security Guide* version 1.254, 6 May 2019 http://guides.dss.gov.au/guide-social-security-law

Brennan, Deborah Brennan. 2007 "Babies, Budgets, and Birthrates: Work/Family Policy in Australia 1996–2006." *Social Politics* 14(1): 31-57.

Department of Families, Housing, Community Services, and Indigenous Affairs,

Department of Family and Community Services, *Guide to Social Security Law Tables* (http://www.facs.gov.au/guide/toc/52histor.htm) March 2003.

Income Support Customers- A Statistical Overview 2010.

Whiteford, Peter Whiteford and Greg Angenent. *The Australian system of social protection – an overview* Second Edition: Draft Policy Research Paper. (on-file) Department of Family and Community Services, *Income Support Database* (on file)

Notes:

Differences in the replacement rates of unemployment and sickpay benefits between CWED2 and CWEP are due to the inclusion of family benefits in the net benefit calculation.
Gross APW series has been updated in CWEP based on the 2018 release of OECD Taxing Wages Comparative Tables and are slightly lower than CWED2 APW series.

Austria

Wages
The APW wages for 1980, 1982, and 1961-1979 are based on the hourly wage index for manufacturing in the OECD database. This index is chosen over the Austria Stats "Gross wage per capita" because it tracks most closely to the APW reported for 1979-1990 (excluding 1980 and 1982). Other wages from *Taxing Wages* series. APW after 2004 is estimated from the 2004 APW base and changes in the new OECD AW in Taxing Wages Data Table.
Update: the child allowance was replaced with a child credit in 2019.

Unemployment Insurance:
Sources: Because Austria joined the EU in 1995 MISSOC does not cover Austria for earlier years. Codings are therefore based on the unemployment insurance laws (*Arbeitslosenversicherungsgesetz* [AlVG] 1958 and 1977 plus amendments). From 1995 to 2001 MISSOC substantially abridged the actual rules by reporting a single nominal rate. As *SSPTW* correctly states, the unemployment benefit was based on gross wage tables and fixed amounts until the end of 2000. The replacement rate thus varied from ca. 35% to 62% in the 1960s (high income vs. low-income earners), ca. 38% to 58% in the 1970s, ca. 40% to 62% in the 1980s and ca. 36% to 58% in the 1990s. The tables were (un)regularly adjusted as amendments to the AlVG. We followed the legal rules even after 1995 in order to provide a consistent time series without any break. From 2001 on MISSOC is in line with the legal rules as major amendments to the unemployment insurance law came into force (Amendment BGBl. 142/2000), which dismissed the wage tables, turned to a fixed nominal rate of 55% of the *net* wage. In addition, families receive a supplement and both a floor and an upper ceiling for the benefit apply: since AlVG 1958 §21 (6) states that the benefit may not exceed 80% of the net wage (since 2001 60% for singles and 80% if entitled to family supplements). This leads to the fact that unemployed with a very low wage may receive even less than the floor. Unemployment benefits are not subject to taxation. No social security contributions are due.
CWEP Update: all benefit and replacement rate calculations come from Greifswald version.

Sickpay
Sources: Data prior to 2000 are from the social insurance law (*Allgemeines Sozialversicherungsgesetz* [ASVG] 1955 plus amendments) and SSPTW, then from MISSOC.
Notes: Sickness insurance combines a compulsory demand to continued wage payments and compulsory insurance. The terms of the required insurance from employers has become more generous (i.e. from 4 to 10 weeks until 2000, and 6 to 12 weeks afterwards), while the social insurance amount (after the wage continuation period) has not. Family supplements are paid as an extra percentage (10% for a dependent spouse and 5% for each children; but max. 75%) on the sick pay percentage~~)~~ when it is paid. The terms have been subject to two major reforms, in 1974 and 2001. That 1974 reform provided that employers pay full salary for 4 to10 weeks (after 25 years employment) for wage earners. Later on salaried employees were entitled to 6-12 weeks plus four weeks of "mixed income", i.e. they received 50% of their wages from employers plus half the sickness benefit. In 2001, the terms for wage earners were equalized with those for employees.

After the continued wage payment, the sick pay starts with a rate of 50% for the first six weeks (42 days) and from the 43rd day it increases to 60%. The weeks of "mixed income" already count for the duration of the payment.
CWEP Update: all benefit and replacement rate calculations come from Greifswald version. Changes in replacement rates reflect updates to net wage calculations from Greifswald version.

Taxes:
Income derived from the continued wage payment is fully liable to both taxes and social security contributions. Contrary, in principle sickness benefits are exempt from social security contributions and income taxation. However, the income law (*Einkommenssteuergesetz* [ESTG] 1988 introduced an upper ceiling (§ 69 (2)), i.e. benefits below this threshold are (still) tax free. Benefits above this threshold are taxed at a "temporary rate". At the same time the beneficiary is obliged to hand in an income tax statement at the end of the year when the final tax wedge is estimated. For simplicity's sake in our estimation the benefit above this threshold is added to the taxable base of the continued payment, which is then taxed at normal rules.
CWEP Update: all net wage calculations come from Greifswald version

Minimum Pension
Sources: Reported amount is the Minimum Pension provided by SSPTW up to 1977. From 1979-present, data is from Austrian Statistical Yearbook and MISSOC.
Notes: The amount provided is NOT the real minimum social pension, but the supplement to one who qualifies for a pension with 15 years (180 months) of contributions. A true minimum is the *Sozialhilfe*, as in Germany). The *Sozialhilfe* is also given since 2000 from MISSOC. Min pension however is assumed to be subject to a deduction for health contribution (in recent years 3%).
CWEP Update: all net wage calculations come from Greifswald version resulting in changes in replacement rates

Standard Pension
Sources: SSPTW, MISSOC
Notes: [Revaluation of past earnings is based on a schedule Aufwertungsfaktoren from the government. It differs from an APW wage index] The first wage earner plan began in 1938; however, personal communication from the Austrian pension office states that (at least back to the 1960s), workers were still credited for work accumulation purposes, and could thus receive a full (79.5% to, and 80% since, 1995) replacement rate. The accrual rates increase for the number of years worked, though the exact algorithm varies slightly over the years. (The precise algorithms are given in SSPTW and MISSOC but are not derivable without an annual covered earnings series.)
The "past wage" is the wage in the year preceding the retirement, since (from 1967 at least) earnings were revalued with changes in covered earnings, and we could not locate a covered earnings index. Prior to 1967, our sources do not suggest any indexing of past earnings, so the pensionable wage is the average nominal wage from the five previous years.

Pension reforms: Starting in 1984 the years of earning considered in the computing the pension increased from 5 to 15. From 2003 it began rising again, and the averaging is to extend to the entire worklife]. The net effect of the longer averaging and the Aufwertungsfaktoren actually used trims the gross pension benefit. The net benefit has remained more stable due to rising SS charges on workers.
Starting in 2000, the pension adjustment (for pensions in force) was moved from "covered wages" to "net wages."
Tax: A 1999 tax reform (first reflected in 2000 calculations) provides for a potentially tapering tax credit to pensioners. We used the taper rate in preceding system to estimate any taper. In applicable years (before 1994), sole earners credit is granted to pensioners in our calculations; this in addition to pensioner credit.
Over time, the wages on which the pension is based have increased; from last 5 years until the early 1980s then last seven, nine then ten by 1987, and finally the best 15 years since 1995.
CWEP Update: all net wage calculations come from Greifswald version resulting in changes in replacement rates

Coverage

For all three programs insured and recipient data from the *Austrian Statistical Yearbook* to 2010. From 2011 insured data from Austrian Social Security (https://www.sozialversicherung.at) and pension recipient data from Statistics Austria (http://www.statistik.at/)
Sickness: Coverage based sick fund members excluding self-insured and less "pensioner beneficiaries in social security schemes." All SS pensioners are assumed to be covered by the funds. Non-agricultural self-employed have a separate fund. (Flora's figures from *State, Economy and Society* are included the table in a later column. They suggest coverage is 3-7 points lower than my estimates.)
Unemployment: Insured data from yearbooks. (They are consistent with Flora in overlapping years.) Civil servants included as insured. Beneficiary data is annual average, also from yearbook.
Pensions: [need to update] 1970, 1975, 1985-2002 Data are pensioners above retirement age from Austrian microcensus provided by the Chamber of Labor. Interceding years are interpolated. Figures prior to 1975 are estimated on the 1975 base and the annual changes in the number of total pension beneficiaries under social security schemes less disability pensions and less orphans' pensions. Data on those in the labor force insured for a pension is taken from yearbooks. Pensioner figures should include civil service and social pensions.

Qualifying Conditions

Generally, SSPTW and legal rules up to 1999, then MISSOC
UE: waiting days data from AlVG; duration is age and insurance dependent. Duration is what our notional worker qualifies for (though that benefit actually requires only 156 weeks of insurance in last 5 years rather than full insurance since age 20). An amendment to the AlVG in force August 1st, 1989 introduced a prolonged duration of 39 weeks if the beneficiary is >=40 year of age and has worked for six out of the last ten years; hence the duration is coded as 312 weeks.
Sickness: Since ASVG 1958 up to 1995 the insurance benefit duration was 26 weeks. It was increased by Amendment BGBl. 411/1996 for a prolonged duration of 52 weeks if the beneficiary was insured at least 6 month during the last 12 month preceeding the sickness. The wage continuation is considered additional duration to the 26/52 weeks. The qualifying

period may look very high on first sight; however, our notional workers qualifies for a continued payment of 8 and later 10 weeks only because he has been working for >=15 years, i.e. 780 weeks.
Continued Payment Act
https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10008308
Sick Pay
https://www.usp.gv.at/Portal.Node/usp/public/content/gesundheit_und_sicherheit/krankenstand/krankengeld/Seite.970003.html
Pension: Since workers could accumulate credits for years before 1938, we use the full qualifying period of 45 years back to 1960 (see notes for Austria standard pension above)

Acknowledgements and other sources
Sources for taxes and upgrading of wages for pension computations
Insurance limits: Philippe Ruh, University of Zurich
Income taxes for 70s and 80s Anton Rainer. BMF
Sickness benefit rules and benefit taxation issues: Heidemarie Pührer and Jürgen Radics. Hauptverband der österreichischen Versicherungsträger (HVB; Main Association of Austrian Social Security Organisations)

Belgium

Wages
Prior to 1993 wages are estimated based on changes in the hourly manufacturing wage rate reported in OECD MEI dataset. From 1993 to 2001 wages are the Average Production Worker (APW) from *Taxing Wages*. From 2002 to 2017, wages are the APW estimated based on changes in the Average Worker (AW) wage from the *OECD Taxing Wages Data Table (6/2019)*.
Data on social contribution rates and earnings ceilings are from SSPTW for 1971, 1973, 1975, 1979, 1981. For the years 1972, 1974, 1980 and 1982 the contribution rates are estimated based on the previous year.
Taxes: in computing net wages we have updated the tax parameters to include a tax credit for singles starting in 1989, an additional tax credit for lone parents starting in 1987.

Unemployment insurance
Sources: Data on the maximum amounts is generally from SSPTW, but from Belgian authorities for 1981-1987, and from MISSOC for 2000-.
Notes: A maximum benefit amount is assumed to apply for all years since at least 1969. Until at least the early 1970s, benefits varied by age, marital and family status, with explicit discrimination against young and women. From 1973, references to this discrimination cease, and this is presumed to be the result of changes in the scheme (late 1971 through 1973) which took it from a flat-rate to an "earnings related" system (Flora, ed. 1986, *Growth to Limits* Vol 4, p. 777). Flora notes that the system reverted back to something more of a flat rate system due to the levels of minimum and maximum benefits. There were also provisions for lower benefits for those living with income earners, though these are not relevant for the notional household units.
Tax: Replacement income was not taxed until 1977 tax year (i.e., on 1976 income). From then, there was a maximum tax deduction/credit specifically for replacement income which made benefit effectively untaxed when there is no other income.
SSC: no social security contributions are levied on unemployment benefits according to the OECD Tax and Benefit policy descriptions
Policy updates: as of 2013, the replacement rate for benefits changed from 60% to 65% for the first three months of receipt and 60% for the subsequent nine months of receipt
***There is a social contribution paid on higher replacement incomes starting in 1994, but the threshold does not apply to the household types studied here.
CWEP update: Updated maximum daily benefit rates. Corrected clerical error in CWED replacement rates.

Sickness
Sources: data from SSPTW and MISSOC since 2000.
Notes: Sickness benefits have been differentiated by wage-earner/salary status, with salary earners given somewhat more favorable treatment (though often via employer requirements). There is a mandatory employer compensation period, and then a social insurance fund period.
Tax: replacement income was not taxed until 1977 tax year (i.e., on 1976 income). Only the employer provided portions have SS taxes deducted. From 1977, there was a maximum replacement income deduction, above which income was taxed normally.

CWEP Update: We use the amounts and rates for manual workers. The employer pays 100% of wages for the first 7 days, then 60% plus a supplementary allowance of 25.88% from days 8-14, from days 15-30 workers receive 60% from insurance and the supplementary amount of 25.88% from employers. From the 31st day workers receive 60% from insurance. Prior to 1977, the employer provided compensation is assumed to be taxed as wage income, but the insurance portion is untaxed (This accounts for higher replacement rate estimate for the early 1970s in CWEP compared to CWED2)

Minimum Pension

Notes and Sources: Amounts for social pension provided by Belgian Social Security Office and MISSOC (for years from 2000). Untaxed. The minimum pension was introduced in 1969.

CWEP Update: from 2010 on minimum pension is taxed as pensions. Removed work related allowances from pension tax calculations. Replacement rates differ in CWEP due to clerical error in CWED net wage used in RR calculations.

Standard Pension

Sources: Pensions are computed using earnings history since 1955 revalued for changed in earnings index, with full pension assumed. Prior to 1967, there was a mixed regime, in which enrollment in the old regime could be credited for full benefit rights, while in the 1970s the system granted full pension if enrolled since 1955. We took the average revalued creditable earnings from 1955 times .60 (single) or .75 (couple) for years prior to 2001, and then for prior 45 years (max earning period) after 2001. We assumed a fixed revaluation index given in 2012. (We substituted the maximum pensionable earnings in the calculation if the assumed wage in the given year exceeded that maximum.)

NOTE: Net replacement rates are substantially lower than rates reported in the Version 1.1. There revaluation of past wages was equal change in APW wages.

Tax: not taxed until 1976, and then subject to a replacement income deduction.

Updates: minimum pension values for a full career have been updated using SSPTW (early years) and MISSOC (from 2002). Missing years have been assumed as the average of the year preceeding and after the missing year.

CWEP Update: in the calculation of taxes on standard pension benefits the addition of the tax reduction threshold significantly changed the amount of tax due across years (previously we had the thresholds for UE benefits, but there are specific thresholds for other types of replacement income) Source: Tax Survey. Updated pension indexation values by adding wages back to 1926 (from 1956 in CWED). This increased the final pensionable wage. Removed work related allowances from pension tax calculations. Removed work related allowances from pension tax calculations.

Qualifying Conditions

Sources: SSPTW and MISSOC, OECD (Benefits and Wages)

UE: For all years, full benefit duration is one year for a single person, indefinite for person with dependents. For singles, the conditions for period after the first have been gradually tightened for those with less than 20 years eof employment. Until the early 1980s, benefits after the first year were cut from 60% to 40% (with proportionate cut in the max benefit). During the early 1980s, the 40% rate applied in the second year, and benefits in subsequent years were reduced to half of the minimum wage if one was not disabled or had less than 20 years of employment. This provision was gradually altered by extending the 40% period for 3

months for each year of insured employment. In the 1990s, the minimum 40% period was cut to 6 months, but the longevity bonus (3 months per year of employment) continued.
Pensions: In all years covered, pension is payable after 35 years of service and at age 60.

Coverage

Unemployment: Insured data from Federal Ministry of Employment and Labour. Series includes public employees as insured because they are either insured or cannot be fired. Most public employees are technically listed as not covered in the SSA description. (Flora's data likely excludes public employees explaining why it is much lower.) Recipient data through 1994 from Yearbooks. Unemployment benefit recipients through 1995 (from yearbooks) also included in table. We include all employees in the public sector and public employees.
https://www.rva.be/nl/documentatie/statistieken/cijfers/tegen-werkloosheid-verzekerden-en-werkloosheidsgraden

Sickpay: Titulaires indemnisables in *Statistical Yearbook of Belgium* (various years) through 1995 for general regime and independents. In general regime, figures exclude disabled. There is a reform law in 1994, but missing data for 1995 and 1996. It is unclear whether the drop between the new and old series is due to the policy change or different data collection. From 1997, data from INAMI webpage Statistiques des indemnities (
https://www.inami.fgov.be/fr/statistiques/indemnites/Pages/default.aspx
) (Flora's series in *State, Economy, and Society* only appear to include those covered in the general regime.)

Pensions: Beneficiaries of old age and survivors pensions from Federal Pension Service (https://www.sfpd.fgov.be/fr/centre-de-connaissances/statistiques/statistiques-salaries#annuelle). Until 2002 we calculate coverage using the population age 65 and older and women age 60 and older. From 2003 we calculate coverage using the population age 65 and older.

General updates

Information on the taxation of replacement incomes comes from the Belgian Tax Surveys (various years). The latest available Tax Survey is applicable to 2017 income.Information on tax credits for different household types has been updated to include lone parent and child tax credit benefits. Tax credit amounts vary by type of replacement income. In CWED these were calculated based on the unemployment benefit rules, in CWEP each income category has its own rules applied (unemployment, Sicknes, Pensions).

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Joseph Remy, Federal Public Service Employment, Labour and Social Dialogue, maxima for UE insurance for 1980s
Belgian Ministry of Finance provided detailed information on the taxation of replacement benefits over the years.

Websites

Wages (Prior to 1993): OECD MEI Dataset:
http://www.esds.ac.uk/international/support/user_guides/oecd/mei.asp#access
Wages (2002-2010): OECD Benefits and Wages: Country Specific Information.
http://www.oecd.org/document/7/0,3746,en_2649_33933_39618653_1_1_1_1,00.html

(Year links under "Budget Constraint Calculations and Charts," Identify AW=Average Wage)
Taxation: Tax Reduction for Replacement Income: Belgian Federal Public Service. Research and Documentation Department. Belgian Tax Survey Archives.
http://docufin.fgov.be/intersalgen/thema/publicaties/memento/memento_archief.htm
Sickness insurance information: http://inami.fgov.be/
Pensions: http://www.onprvp.fgov.be
Pension revalorization coefficients: https://www.sfpd.fgov.be/fr/montant-de-la-pension/calcul/types-de-pensions/salaries/salaires/revalorisation-des-salaires#tableau
Unemployment: http://www.onem.fgov.be/

Bulgaria

Wages
Average wages from Eurostat NACE rev.2
https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do

Unemployment
Earnings related benefit scheme. Benefits are not subject to taxation. No social security contributions.

Sickness insurance
The benefit equals 80% of the beneficiaries' previous gross income, yet no more than the net income. No changes during the reference period.
Benefits are not subject to taxation. No social security contributions.

Minimum pensions
Social pension for old-age (Социална пенсия за старост). Benefits are not subject to taxation. No social security contributions.

Coverage
Data on the number of insured for both sickness and unemployment benefits stems from: National Social Security Institute. 2010. *Social Security in Bulgaria. Information, data, facts.* Sofia: NSSI (http://www.noi.bg/en/). The NSSI covers and manages both sickness and unemployment benefits.

National sources and acknowledgements
Data on the different social insurance programs was also extracted from national legislation: CODE OF SOCIAL INSURANCE (Title amend., SG 67/29 Jul 2003): http://www.noi.bg/en/content/legislation/SICode.pdf)
Benefit rates for minimum pensions: National Social Security Institute (http://www.nssi.bg)
We would like to thank Dr. Michael Hein from the University of Greifswald in supporting us with the extraction of benefit data from national legislative documents.

Canada

Wages

According to 1977 publication Tax/Benefit Position of Selected Income Groups, Canadian wage data considered all employed, not just males, in the 1972-78, 1980, 1982 series. *However*, the series used appears to have been an hourly wage series, not the weekly earnings series used in the more recent years. Such a series also exists for earlier years from Statistics Canada, and is more consistent with the 1979, 1981, 1983-present figures. We estimated the gross and net APW for years 1961-1978, 1980 and 1982 using the average of the monthly series of weekly wages provided by statistics Canada and derived tax statistics from *Taxing Wages*. Subsequent data is from the OECD's *Taxing Wages* series, and APW is estimated from the AW series.

Tax data

from 1972-82 from mimeos from the Canadian Tax Foundation. Information on tax bands from 1981 from Canadian Authorities. Up to 1992, the family/child benefit was taxable. *More recent from Taxing wages*

Unemployment, Maternity, Paternity, and Sickpay

Source: Data for UI programs came from the on-line history of Canadian unemployment insurance, and from *Social Security Program Throughout the World.* If there is a difference between the two sources, the Canadian sources were given priority. Years after 2011 (i.e., the 2018 updates) are taken from OECD's UI benefits.

Notes: The basic benefits formula is the same for unemployment, maternity, paternity, and sickness programs (though maternity and sickness were not included until 1971). There are some changed employment requirements for non-EI. Also, the non Ei benefits (sick, maternity, parental) do not vary by the national or provincial unemployment rate.

There is ambiguity with respect to the program rules in 1971. The benefit rates reported by SSPTW assume the new program passed in 1971, but they were not implemented until June 1971. Since the on-line history gives no specific information for this year, we have used the old (1970) program earning limits and maximum benefit amounts are in place.

Unemployment insurance in Canada (or as it is now called Employment Insurance) is a compulsory insurance program throughout the period. (There is also an assistance program as well which can be used when insurance entitlement is exhausted, but we do not collect data on that.)

In 1971 reforms to the program, the system changed from being based on a limited number of wage classes to being a set percentage of income, subject to a maximum insurable wage. The replacement rate was reduced from 66.7% to 60% in late 1978. Until 1985, the percentage payable to an APW generally exceeded the maximum benefit amount. Where, subsequently, the maximum is greater than the APW benefit, the maximum benefit can be derived by using replacement percentage and the maximum insurable earnings for the year in question.

For families, there was a higher UI rate (75%) paid from the reform in 1971 to 1975, when an amendment to the UE legislation equalized the single and family rates at .667%. Prior to that there was also a supplemental benefit for families.

Sickness benefits:

Weekly benefits follow EI, but these have always been paid only for 15 weeks. This should be reflected in the replacement rates.

Taxation of Benefits:
All these benefits were made taxable income from 1972 (post 1971 reform). (There are some provisions to pay back EI benefits if annual income is a certain amount, but those provisions are not considered here.)

Minimum Pension
Source: Human Resources Canada, *Income Security Programs Information Card* (various)
Notes: Minimum pension is the Old Age Security amount, plus, since its creation in 1967, the maximum guaranteed income supplement.
Taxation: According to information for Human Resources Canada, this OAS pension (and income-test supplements) has always been untaxed.

Standard Pension
Source: Basic OAS/GIS amounts from source for minimum pensions (Human Resources Canada, Income Security Programs Branch The report quarterly data back to 1952, but we only use the January amounts. (Arguably one could average the Jan to Jan amounts to get a better estimate of the true annual amount.) Earnings related component data computed from details from Income Security Programs Branch of HR-Canada, and benefit maxima from a series.
Notes: Pensions in a given year are calculated on basis of current OAS amount, the earnings related pension (CPP) (i.e., average wage for benefits in year x-1), and a fraction of the guaranteed income supplement, since this entitlement declined at 50 cents on every dollar of other benefit, and our notional workers are sometimes entitled to it if they get no private sector pension.
Computation of Canada Pension Plan:
Note: This is changed from the method used in CWED 1.2.
Introduced in 1966; first CPP pensions were paid on basis of 1967 earnings. In calculating the pension amount, the entitlement progressed from 2.5% of average earnings in program in 1967 to 25% of average earnings from 1976 on. Employees earn points up to the maximum insurable amount each year since 1966. At retirement, the retiree gets the maximum benefit times the average number of points (max=1) over the life of the program (or 40 years or 480 months), with a certain % (now 15%) of low point periods dropped.

Coverage
UE and Sickness: 1972-2001: Statistics Canada series (on file); data for 1950-1971 are annual averages from *Historical Statistics of Canada, 2nd Edition* (Table E166-171). Public employees are covered. Data on UEI beneficiaries for 1950-70 from *Historical Statistics* (E166-171), for 1970- from Statistics Canada. Beneficiaries 1975-present are the average of year's monthly coverage from Statistics Canada. Employment Insurance covers both unemployment and sickness. Persons covered by the Employment Insurance program include public and private employees plus full-time members of the armed forces.
Source: Statistics Canada
(https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410000601)
Pension: OAS average annual number of beneficiaries (HRDC/Statistics Canada; 1960-1970; 1971-2003 on file. Data on population between 65 and 69 for 1960-69 is from BC Stats (http://www.bcstats.gov.bc.ca/). Full labor force is considered insured for (basic) pension. Coverage should include civil servants; they are integrated into the general scheme.
Source: Canada Open Data (https://www.canada.ca/en/services/benefits/publicpensions.html)

Qualifying Conditions
UE/Sickness: Qualifying period based on a 40 hour week. Duration varies by unemployment rate of province.We report the benefit based on the national unemployment rate. "History of Unemployment Insurance Programs," Lin (1998*)*, *OECD Benefits*, and *SSPTW* .
Pensions: *SSPTW*. Pension qualifying years count those for the earnings-related program since its inception. Before 2004, a percentage of low earnings years was dropped, so the years of contributions to get the CPP does not progress smoothly. As of 2004, all years from 1966, or age 18 if after 1966, are considered in computing individual benefits (% of dropped low wage periods is dropped).

Additional information:
History of pensions in Canada at
Income Security Programs Branch of HR-Canada, *Canada Pension Plan Benefit Rates 2002* (on file, also see www.hrdc-drhc.gc.ca/isp/studies/trends/cpprates/cpprates2002.pdf)
Data on contributions, maxima, etc. https://open.canada.ca/data/en/dataset/f8ec9eb8-62d1-487b-83ff-4c407b6cb227
History of UE insurance programs
http://www.mapleleafweb.com/features/employment-insurance-canada-history-structure-and-issues#history
Lin, Zhengxi 1998. Employment Insurance in Canada: Recent trends and Policy Changes, *Canada Tax Journal* 46(1)
Marhsall 2003 "Converging Gender Roles." *Perspectives on Labor and Income* v 4, n 3 (online https://www150.statcan.gc.ca/n1/pub/75-001-x/10706/9268-eng.htm)
[OLD link =http://www.hrsdc.gc.ca/asp/gateway.asp?hr=/en/ei/history/unemployment_insurance introduction.shtml&hs=aed]
F H Leacy, ed. *Historical Statistics of Canada*. 2nd Edition . Statistics Canada. http://www.statcan.ca/english/freepub/11-516-XIE/sectiona/toc.htm

The Czech Republic

Unemployment
The benefit equals 60% of the beneficiaries' previous net income. There is a Minimum and a Maximum amount; both limits are adjusted on a yearly basis.
No social contributions. Not taxable, as benefit is calculated as a proportion of former net earnings.

Sickness insurance
Sickness benefits are calculated from the daily assessment base, which is calculated by dividing the gross income received by the employee in the decisive period (as a rule a period of 12 calendar months before the calendar month in which the social event occurred) by the number of "contributing" calendar days (260) in this decisive period. The daily income calculated in this way is subject to reduction.
Benefits are not subject to taxation. No social security contributions.

Minimum pensions
Persons who do not qualify for a regular social insurance old-age pension are covered by the general social assistance scheme (means-tested). The size of the benefit is defined by the Minimum Living Standard (MLS). MLS consists of a Personal Benefit (depending on age) and a Household Benefit (depending on the size of the household). MLS is tested against all other forms of income.
Benefits are not subject to taxation. No social security contributions.

Standard pensions
The pension consists of two parts, a basic and an accrued amount. The basic amount is 10% of the average salary (9% before 2019), and the accrued amount is 1.5% of the average salary for each year of contribution. The basic amount is based on the average gross earnings in the whole contributory record, starting with the first calendar year after reaching 18 years of age and ending with the calendar year preceding the year in which the pension is granted. Earnings before 1986 are not taken into account. For persons born after 1971 the retirement age is 65, and for persons born before 1971 the retirement age increases incrementally from 60 for those born from 1936-1971. The retirement age for women varies based on the number of children raised, and here we use the age associated with having raised two children.
Taxes & SSC: pensions are taxed, but most do not reach beyond the exemption limit (36 times the monthly minimum wage). Not subject to social security contributions.
Sources: Ministry of Labor and Social Affairs (https://www.mpsv.cz/web/cz). Pension calculator (https://www.cssz.cz/web/cz/duchodova-kalkulacka).

Coverage
Unemployment insurance coverage: Number of working age contributors to an unemployment benefit scheme (ILO SSI)
Sickness insurance coverage: Czech Social Security Administration. Annual Reports 2003-2010. *Clients covered by sickness insurance* (http://www.cssz.cz/cz/informace/informacni-materialy/vyrocni-zpravy.htm (last accessed October 07, 2011).

National sources and acknowledgements
Czech Ministry of Labour and Social Affairs (http://www.mpsv.cz/en/).

Additional information on maximum daily benefit amounts and the method of calculation for sickness insurance benefits was kindly provided by Roman Kidles from the Ministry of Labour and Social Affairs (MoLSA) of the Czech Republic. We would like to thank JUDr. Jitka Konopásková, Head of the EU Coordination and International Relations Department, Czech Social Security Administration, for her kind help.

Denmark

Wages

According to OECD, APW wage from 1983 is based on the average hourly wage and average hours worked for production workers in the Danish Employers Association. From 1987, this it reads “in firms in the manufacturing , building and construction sector”. For 1983 and 1985, it implies all firms in Employers association are considered, though such firms are “mostly in manufacturing, building and construction.” 1982, 1980 and pre-1978 wages are based on the SAF (Swedish Employers association) hourly wage series. Wages for later years are from OECD, with estimates based on changes to the OECD AW series after 2004.
Taxes for 1970-1978, 1980 and 1982 re-computed from the Ministry of Finance Tax Tables. (These are the same or very close to *Taxing Wages*.) For 1970- , they are from the Danish Ministry of Taxation (on file) and OECD *Taxing Wages*. Benefits are considered taxable as normal income for all years for which tax data exist. We consider only the social contribution rate and not the flat rates.

Unemployment

Sources: 1976-1999 *Danish Statistical Yearbook* provided maximum benefit. Pre-1976 data except maxima are from *Social Security Programs throughout the World*. 2000-12 from MISSOC based on January 1. Andersen and Svarer (2007) provide a detailed account of some policy changes which address declining replacement rates. Maxima from by Jesper H. Pedersen and Aage Huulgard, eds. *Arbejdsløsheds Forsikringsloven – 1907-2007 udvikling og perspektiver*, edited, pp. 415 ISBN: 87-91674-03-4
Notes: Danish unemployment insurance is a state-subsidized, union administered voluntary program. The “headline” replacement rate has increased from 67% (80% families) in the mid-1960s to 90% (either) by the early 1970s. The maximum benefit is generally much less than 90% of the APW wage, making the system more of a flat-rate benefit. Though the maximum benefit is supposed to rise with average wages, part of that increase was diverted into active labor market programs in the 1980s, resulting in decline in effective replacement rate through the late 00’s.
Taxes: Taxed as normal income. UE beneficiaries do not pay the earnings related social contributions, and do pay the UE and Pension fixed amount contributions.

Sick pay

Sources: Sick pay rates are from same sources as unemployment insurance.
Notes: The divergence between Sick pay and Maternity rates reported in SSPTW 1961 is assumed to apply to the period before the 1960 Act, and hence is not relevant for this study. In some years amounts are identical to unemployment insurance, in others they slightly different. Provisions for sick pay stipulate that those not in labor market can voluntarily join until 1995.
Taxes: Taxed as normal income.

Minimum Pensions

Notes and Sources: Amounts for basic pension and supplement are maxima for 1976-1999, taken from Danish Statistical Yearbook (various years). Prior years are from SSPTW, and later ones from MISSOC.

Standard Pension
Source: As above for Basic Pension and the maximum ATP for all years from information provided by ATP office (on file).
Notes: The amount is the minimum pension plus ATP. It is the max amount assuming that the person had made full contributions since the inception of the program. For all relevant years, it is assumed that the ATP amount does not affect qualification for basic or supplementary pension. According to Neil Ploug, *Intl Soc Sec Review*, 56, 2003, pp. 65-80, full ATP does not disqualify from full supplement.

Tax data
For 1970-2002 from the Danish Ministry of Taxation (on file). Benefits are considered taxable as normal income for all years for which tax data exist.
In 2015 an additional tax allowance was introduced for single parents and in 2018 an additional job allowance was introduced for those above an income threshold.
Total social security contributions for calculating net wages include both the SSC percentage rate amount and the flat rate amounts.

Qualifying Data
SSPTW, and MISSOC from 2000-.
CWEP update: We revised sick benefit qualification period based on a revision of sources (SSPTW and MISSOC). The qualifying period is based on the number of hours work in a specified period and we assume the notional worker is in full time employment (40 hours per week). In 1970-1 the qualifying period is 1 week, 0 weeks from 1973-82, 3 weeks in 1983, 8 weeks from 1984-1987, 3 weeks from 1988-2012, and 6 weeks from 2013-2020.
Pensions: Universal pension contribution data from 1970-1980 is from the Danish Finance Ministry tax Tables. Qualifying period years are those since the inception of the Danish ATP.

Coverage
Pensioners: Folkpensioners, excluding early retirements (*Danish Statistical Yearbook*); Denominator to 1984 is aged 67+ plus single females 62-66, 67+. Detailed old age population data (excluding over 65 population) from Danish Statistics. For 1960-1970, the proportion over retirement age is assumed to be 94% of over 65 population. The entire labor force is considered covered for benefits in all years. Pension coverage counts civil servants as they are integrated into the national scheme.
Sick-fund members: Dependent labor force to 1972. From 1972, OECD labor force less unpaid family labor. Since 2004, OECD labor force statistics have no longer separately provided data on unpaid family labor. OECD labor force statistics put the number of unpaid family labor in estimates on self-employed persons.
Unemployment: Statistical yearbook listing of unemployed in receipt of insurance beenfits. (Ministry of Labor's Statistical Series AUA01: Insured persons by region, category of insurance fund, age and sex for years after 2006 seems to differen significantly.) This series excludes those on a type of "unemployment pension" that was included in the old series, but who do not appear to be considered in the labor force.
Old source: *Statistical Yearbook*. (UE benefit recipients are the annual average taken (or computed from monthly data) from *Statistical Yearbook.* Public sector workers are included in insured. CWEP update: we replaced the Statistical Yearbook source with the figures from the Ministry of Labor for greater consistency in the series. This resulted in slight variations in coverage rates.

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Andersen, Torben and Michael Svarerz. 2007. "Flexicurity—Labour Market Performance in Denmark" *CESIfo Economic Studies* 53, 3/2007, 389–429.
Green-Pedersen, Christoffer. 2002.*The Politics of Justification: Party Competition and Welfare State Retrenchment in Denmark and the Netherlands from 1982 to 1998.* Amsterdam: Amsterdam University Press.
Jørgensen, Carsten. 2011 Decline in union density threatens collective bargaining. *European Industrial Relations Observatory*. Online. January 28.
http://www.eurofound.europa.eu/eiro/2010/12/articles/dk1012019i.htm
Torben Lundsvig, Head of Section, Labour Market. Statistics Denmark

Websites

Tax Ministry: http://www.skat.dk/english/index.php3?viewCat=99
Statistics Denmark: http://www.dst.dk/

Estonia

Unemployment
Unemployment insurance benefits are earnings related. Until January 2003 unemployed persons only received a very low, flat-rate amount. Contributions to the newly introduced earnings-related scheme started in 2002 (law 2001), with the first earnings-related benefits being paid out in 2003.
General taxation rules without special relief for benefits. No social security contributions, but the Unemployment Insurance Fund pays social tax (*sotsiaalmaks*) (at the rate of 13% for health insurance) on behalf of recipients of unemployment insurance benefits (MISSCEEC).

Sickness insurance
From 1995 to 2005 benefit rate was 60% of gross wage for treatment in hospitals and in-patient settings and 80% for out-patient settings. For the calculation of the replacement rates the latter was taken, as this applies to a larger number of real cases.
Sickness benefits are subject to taxation, no specific release for benefits. No social security contributions from the sickness benefits.

Minimum pensions
Flat-rate national pension (*Rahvapension*). In order to qualify, a minimum of 5 years of residence in Estonia is needed. The benefit is based on the National Pension Rate (R*ahvapensioni määr).*
Taxable, but due to allowances the benefit amount remains below the taxable threshold. Not liable to social security contributions.

Coverage
Unemployment insurance coverage: Data on the number of persons covered by unemployment insurance per year was kindly provided by Anne Lauringson from the Estonian Unemployment Insurance Fund.
Sickness insurance coverage: number of working age affiliates to a sickness benefit scheme (ILO SSI)

National sources and acknowledgements
Estonian Social Insurance Board:
http://www.ensib.ee and http://www.haigekassa.ee/eng/benefits.
Further information and description of minimum pensions in Leppik, Lauri and Georg Männik. 2002. “Transformation of old-age security in Estonia.” In *Transformation of Pension Systems in Central and Eastern Europe*, eds. Winfried Schmähl and Sabine Horstmann: Cheltenham: Edward Elgar, 89–124.
Additional information regarding the benefit data of sickness insurance payments for the period 1999-2008 was kindly provided by Kadri Klettenberg-Paas from the Estonian Health Insurance Fund.
Data on family benefits was made available by Hede Sinisaar from the Estonian Social Ministry.

Finland

Taxes
In 2013 a new tax to finance Public Broadcasting was introduced (Taxing Wages 2014, 274). Between 2015-2017 a child tax credit was in force to compensate low- and middle-income earners for cuts in child benefits (Taxing Wages 2016, 262).

Wages
Notes and Sources: Wage trends follow SAF and the Finnish wage indices reasonably well with the exception of 1982-1983, where OECD is well below the SAF and Statistics Finland growth rates. We've assumed that the OECD gross wage figures before 1983 refer to male wages for *all* of these year (i.e., including 1981 and 1979) and adjust the series accordingly. APW tax is based on computation for 1974, 1976 and 1982, with intervening years based on extrapolations. APW wages since 2004 are estimated from change in the OECD AW series from *Taxing Wages*.

Unemployment
Sources: All data and information are from Finnish Ministry of Social Affairs, Statistical Yearbooks of KELA, *SSPTW*, and *MISSOC*. Flat rate amounts or reference wages for income-related benefits are different for some years among above documents. At that time, we follow Finnish government documents. Pre-1968 benefit information from *Social Security Programs Throughout the World*.
Notes: Finland has two separate categories of unemployment benefits: unemployment insurance (UI) and unemployment assistance (UA). UI was introduced in 1917 and UA in 1960. UI is paid to an unemployed person who was a member of UI funds (Ghent system) and worked at least 43 weeks (for 23 weeks before 1997) prior to unemployment. Membership of UI funds is voluntary, but roughly 85% of workers belong. UA is financed by the state and is payable to an unemployed person who was not a member of any UI fund. UA did not require a qualifying period except first-time employees (work experience of at least 3 months is required for first-time employees) until 1999. *After 1999, UA require the same qualifying period as UI*. Those unemployed who do not fulfill any unemployment condition or who have exhausted their UE benefits are eligible for means-tested benefit provided by the labor market subsidy (Saarela, 2004; Verho, 2008). The coding sheet includes UI and UA benefit series, not the labor market subsidy. Benefits of UA are generally less than those of UI. After the 1984 reform, UA benefits are the same as the flat-rate of UI. Before 1984, UA benefit amounts varied depending on family status and local cost-of-living levels, and are not provided here.
At first, both UI and UA were flat rate benefits. But, after the 1984 reform (became effective in 1985, and became taxable income), UI included an earnings-related benefits equal to 45% (42% 1992-2001) of the difference between the daily wage and the basic allowance (a flat rate).
There was a progressive replacement rate on earnings above the flat rate amount with two bend points. Earnings-related benefits are calculated on the basis of the employee's regular monthly wages for the 10 months preceding unemployment. The 2002 reform (became effective in January 2003) added increased earnings-related benefits for an unemployed person who (i) had lost a permanent job for "economic or production-related reasons", (ii) had been members of an UI fund for at least five years before losing their job, (iii) had at least 20 years of employment history, and (iv) had not received severance pay during the past five

years. The increased earnings-related benefits are increased 45% to 55% of the difference between the daily wage and the basic allowance (from 20% to 32.5% of the wages exceeding the threshold) during the first 150 days. After 150 days, the usual earnings-related benefits are applied (Verho, 2008). Maximum UE benefits were equal to 75% of normal earnings in insured's occupation, but, in 1985, increased to 90% of daily wages before unemployment (including dependent supplements).
From 1992, we account for extra social charges for pension and UE insurance levied, which is deducted from the reference wage, and not the tax computation. (The charged rate is usually lower than what is paid by APW, and benefits increased to partly compensate for the charges.) The charge for sickness insurance and national pension is based on the municipal taxable income and the rate was added to the municipal tax rate in the "Tax" column. Dependent supplements for even-numbered years are estimated for 1986-1998.
Update: From 2006, the health levy is deducted from the reference wage. Child and single parent cash benefits were added to the net benefit calculation.

Sick pay
Sources: Formulae for the system since 1982 and maxima for 1971-1982 provided by the Finnish Social Insurance Institution (KELA) (on file). Earlier data (pre 1971) are from the SSA, confirmed by KELA.
Notes: Up to 1982, the sick pay/maternity pay system is earnings-related up to a maximum amount. The system paid a fixed sum plus ER percentage for lower incomes; above a certain earnings level there was a progressive ER benefit (i.e., the total RR percentage declined at higher as income increased). Starting in 1982, the benefits were increased and made fully taxable. After 1992 (as with unemployment insurance) daily reference earnings are reduced for ER pension and UE insurance.

Minimum Pension
Sources: Data from KELA Statistical Branch (on file) and MISSOC from 2010.
Notes: Minimum pensions data include the basic rate and supplements. A minimum pension such as this includes income/means tested benefits, and is assumed not to be liable for tax in all years. Based on basic National Pension.
Update: in 2012 a Guarantee pension (Takuueläke) was introduced and guarantees a minimum pension for residents with a small pension or with no other pension.

Standard Pension
Sources: Information on calculating pension is based on SSPTW, ETK (Central Pension Security Institute), and KELA.
Prior to 1980, the assistance pension was means-tested, after that it is pension-income tested in a transitional period from 1981. (This change helps to account for the measured jump in standard pension replacement rates after 1981.) Standard pension traditionally combined the basic pension with an earnings related one. However, since a 1996 reform, the basic pension became income-tested, and withdrawn euro for euro with an employment (earnings related pension) pension over that amount.
The basic/universal pension is increased with inflation.
Calculation of the ER pension has been changed over the years. Originally, the pension *accrual* rate for the pension was 1%. Years of service before 1962 received half service credit, and thus were counted as effectively an accrual rate of .5%. The wage averaging period was the last two years, and past wages and pensions in payment were uprated by a wage index. In 1968, the averaging was the best 2 of the past 4 years of revalued wages.

Starting in 1976, the accrual rate was changed (retroactively according to ETK) to 1.5% for years from 1962. However, years prior to 1962 continued to receive half credit *and accrued benefits at only 1%* (hence, effectively .5%, so the overall "credit" for years before 1962 was unchanged). Accrual remained capped at 60%.
From 1977, revaluation of wages and adjustment of pensions in payment was based on TEL5050 (a equally weighted average of wage and price changes).
From 1979, wage averaging became the middle two of the last four years of the revalued wage.
From 1994, accrual rates increased on to 2.5% earnings from work between ages 60-64. though the maximum accrual percentage remained still 60%.
From 1996-2004, the number of earnings years averaged goes from 2 to 10 years, with the high and low (apparently) still dropped.
In 2005, there was a major reform. This increased accrual rates from age 52 from 1.5% to 1.9%, and for those from age 63 to 4.5%. (However, the employee pension contribution rate for those over 52 is higher.) The entire wage history is used to compute the benefit, and revaluation of past wages is on a 80 wage/20 price index. (Pensions in payment are indexed on a 20/80 basis). The maximum accrual limit of 60% was abolished. Generally, pension rights earned prior to 2005 are based on old rules, with new rules applied going forward. However, those retiring before 2012 can compute their pension on both rules and choose the more favorable. Those in a job in 2005 may choose to apply either old or new rules to that job. (The ER wage averaging calculations are applied for each job.)
NB: For our simulation, we will apply the better rules until 2012, and then apply the general rule.
Updates:
In 2010 there is a Life Expectancy coefficient applied that reduces the pension amount by a percentage equal to 1-LE coef.
In 2017 a new pension reform was implemented. The age-related accrual amounts were standardized to a single accrual rate for the entire working career of 1.5%. There is a transition period until 2025 where the accrual rate for ages 53-62 is 1.7%. The pension contribution is no longer deducted from the pensionable wage.

Taxes on pensions: Until 1983, only the ER portion of the pension was taxed. Since at least 1995 there is a "special" deduction for pension income; it is assumed that this special deduction existed in some form from 1983, and its maximum is equal to the full assistance pension. (For years since 1995, this is confirmed as the maximum allowance) From 1995 to the present calculated deduction follows the rules provided by tax authorities. *For previous years, this amount, or whether it existed is not known.* From 1997, the deduction limits have been such that the deduction for pension income equals the standard deductions for normal income earners (information comes from Finnish authorities.)
Pensioners pay a higher health care tax than workers since 1992 and paid a tax for the universal pension for 1993-2002. The amount varies and is phased out slowly from 1998. (The latter tax is mentioned in *SSPTW* 1993, but not in 1997. It is treated as removed in the pension reforms in 1996). This social charge is included in the tax column.
There is a national and municipal tax, with different deduction amounts for families (as there is a municipal deduction for children. The basic pension and health/sickness insurance tax rate is computed on the municipal tax base.
From 2000, the OECD stopped counting the church tax, but we have included it based on the most recent rate.

Qualifying conditions
Conditions are from *SSPTW, MISSOC*, and various Finnish sources. *Correction*: Sickpay requires 0 qualifying weeks, but one must have been employed at some time in last 3 months (unless laid off) to claim. MISSOC reports zero waiting days between 2013-2017, however there is still a need to be certified of illness from the 9th day following illness onset, so we maintain the 10-day waiting period.
Pensions: Length of qualifying period (40 years throughout) based on the fact that each working years prior to 1961 contributes to the employment pension.

Coverage
Pensioners: National Pension recipients above age 65 only. Full coverage assumed after income-test implemented in 1996. Social Insurance Institution (KELA) *Statistical Yearbook of the Social Insurance Institution 2002* (2003) *and 2010* (2011). (Single female retirement age is assumed to remain at 60 throughout. Though 1987 Act equalized retirement age, but it applied only to new employees.) Entire labor force counted as covered for the National Pension. Civil servant scheme is integrated.
Update: data on pensioners reviewed and updated from 1981-2019 from Kela statistics database
https://www.kela.fi/web/en/statistical-publications_statistical-yearbook
https://tilastot.etk.fi/pxweb/fi/ETK/?rxid=5ea6f54b-39a6-4d53-8adc-cfab8c1c10e6
Unemployment: Unemployment fund members. *Finnish Statistical Yearbook* (various years). Public sector workers included. Benefit recipient data are monthly averages, also from yearbook. It consists of regular (earnings-related) benefits, state basic benefits and those, in recent years, in subsidized employment.
Source: Statistical Yearbook of Finland (https://www.doria.fi/handle/10024/67152)
Sickness: Full coverage for labor force assumed after 1963 law. (Consistent with Flora)

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Anna-Riitta Laakso, ETK Legal Department, Standard pension accrual.
Mikko Kautto, Head of Research Department, Finnish Centre for Pensions

Websites
KELA (Finnish Social Insurance Institution): www.kela.fi

France

Taxes
A special tax reduction was in force for 2017 & 2018 tax years (Taxing Wages).
The earned income tax credit Prime pour l'emploi (PPE) was in force between 2001-2015.
In-work benefit was established in 2016, but it is not applicable to the income levels included here. The basic allowance was abolished after 2006 (Taxing Wages).

Wages
APW wage for 1972-1978, 1980 and 1982 computed from the "wage rate, business sector" series from OECD. (This source is close to wage in *Taxing Wages* in 1979, 1981 and 1983.) Effective APW tax rates are based on calculations for 1982, 1976 and 1974 for singles. For families, the effective rate is the SS contribution less the family benefit divided by wages.
Update: Wages after 2004 estimated from the OECD AW series in *Taxing Wages*

Unemployment
Sources: Rates and maxima from *SSPTW* to 1995, OECD to 1999, and MISSOC from 2000. (Overlapping data is consistent.) Update: minimum daily rate updated with IPP
Notes: There was a widespread but non-statutory earnings-related benefit system in place until 1967/8. This agreement was then legalized. From 1979, the system shifted from a stated percentage of past salary to a flat-rate plus earnings related system. Following the reform law in 1979, there was a special allowance system for those with longer coverage who were laid off "for economic reasons." In 1982, according to EIRO on-line (http://www.eiro.eurofound.ie/2000/06/feature/FR0006171F.html), the government changed the system from one that paid based on circumstances of job loss to the period of contributions. In 1984 there was a re-imposed "dual" system with bipartite funds and a government system of assistance to those who do not qualify under that program In 1992, the two schemes were merged to create a fund with a declining rate of benefit every four months following the initial benefit period. That initial period varies by age and period of insurance. Only about 40% of unemployed are paid from the ER system as of 1998; most are in the assistance system, and thus receive a much lower benefit.
Updates:
Starting in 1992 there was a sliding scale of benefits where benefits were reduced every four months, changed to 6 months in 1996, eliminated in 2000. In 2001 the old "single digressive allowance" (AUD Allocation Unique Dégressive) was replaced with the "Assistance Allowance Returning to Employment" (ARE). Under this system, the benefit is based on a daily reference wage (SJR). We follow the OECD Tax/Benefit Model and calculate the SJR as the gross annual wage divided by 365 days of the year. There are minimum and maximum values, and the calculation of the benefit depends on income.
Sources: Tax/Ben 2001; Arcanjo 2012.
Arcanjo, M. (2012). Unemployment insurance reform–1991–2006: a new balance between rights and obligations in France, Germany, Portugal and Spain. *Social Policy & Administration*, *46*(1), 1-20.
Social contributions on unemployment benefits include a special health contribution (1985-1997), supplementary pension contribution (from 1988), CSG (from 1991), and CRDS (from 1996).

Taxation. Benefit assumed to be income taxed as normal income throuhgout, though no income tax is ever due in the family amount. The SS deductions are based on a lower rate for sickness (from 1980), for retirement (from 1988). CSG (and CRDS) are paid from their introduction in 1993 (1996). Based on OECD 1999 (and MISSOC tables for later years) the sickness SS payment is dropped from 1998.
Update: Tax and ssc parameters updated based on IPP tax and benefit tables (including missing years 1970-3).

Sick pay
Sources: Data on rates and the existing limits (back to the 1940s) comes from CNAMTS (on file).
Notes: Sickness benefits are paid daily, so the amount is wage *50% or maximum daily benefit * 7*52.
Waiting period is listed as 3 days, though the 1997 SSPTW suggested that the employer paid this period. (Not clear when or if this applies generally.)
There is some uncertainty about our replacement rate of maternity benefits. It is listed as 84% in the CNAMTS information, but 90% in the SSA. (The max amounts seem to match across the two sources, if one assumes the figures in SSA may quote a six-month earlier or later period.)
Taxation: Benefits are assumed to be taxable for income tax (there is no indication that other charges are withheld for sickness), but not social charges, except CSG and CRSD (where in force).

Minimum Pensions
Sources: Minimum pension amounts are the AVTS + supplement. The data are from DREES (on file), and are consistent with SSA figures. (Prior to 1992, the AVTS plus supplement is twice the singles rate; from 1992, the supplement for couples is less than double the single rate).
Taxation: The minimum pension is not taxable, even for CSG.
Update: In 2007 the minimum pension scheme is replaced by the ASPA, however, those under the old scheme continue under the old scheme. All values have been updated using IPP https://www.ipp.eu/ipp-tax-and-benefit-tables/en/social-benefits/3/minimum_vieillesse_droits_non_contributifs_de_retraite/as/

Standard Pension
Sources: SSPTW, earning revaluation factors from CNAV to mid 1990s, then the March "indice du salaire mensuel de base de l'ensemble des salaries" from INSEE.
Notes: The standard pension is the state portion only, and is based on the general regime and a retirement age of 65 (though the "official" age is 60). The couple rate includes a supplement. The earnings basis is average revalued earnings.
From 1994, the years counted in the computation increases by one year until best 20. In addition, from 1995, revaluation of past wages changes from wages to prices.
Taxes: CSG and income taxes payable. IN prior years there is a pensioner health charge that becomes rolled into CSG.
Occupational Pensions: data on point values comes from Institut des politiques publiques (IPP): https://www.ipp.eu/en/ipp-tax-and-benefit-tables/. Taxable as above.

Qualifying Conditions
SSPTW, with supplementary info from MISSOC from 2000, and OECD for UE from 1995. Add'l supplementary information for unemployment insurance is from Unedic and a paper by Christine Daniel (see below)
Sickness: Qualification and duration data are for the full extended benefits, not the minimum period.
Unemployment: information provided for the regular program only

Coverage
Pensioners: Coverage in labor force from Flora pre-1975. Retirees in receipt of pensions can only be estimated crudely. Figures provided for various years from 1979-1994 are based on estimates from the Luxembourg Income Study data set household files as of 12/4/2004. LIS data implicitly incorporates civil servants.
Update: number of recipients of old age pension from 1970-2018 from CNAV Statistical Compendium.
https://www.statistiques-recherches.cnav.fr/recueil-statistique-2018.html
UE: Unedic periodic reports, specifically: *Statistiques Annuelles de Effectifs Salariés Affiliés* July 2004. Beneficiary data is comprised of estimates for percentage of UE covered by insurance, and those covered by state solidarite funds. 1972-1985: INSEE, *Donées Sociales 1987*, 1986-2003: average of monthly data from ASSEDIC. (Total unemployed figures used are from ASSEDIC, not OECD)
Sickness: Percentage covered based "Assurance Maladie effectifs des cotisants des diffe'rents re'gimes" in *Annuaire Statistique de la France* through 1987.plus all government employees with government employee estimates from Thomas Cusack, "Public Employment Dataset" (http://www.wz-berlin.de/mp/ism/staff/cusack_data_sets.en.htm).

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Christine Daniel (with assistance of Jé"rôme Bassot). "L'indeminisation du Chomage depuis 1979: Une Analyse per cas-types." Institut de Recherches Economiques et Sociales working paper, March 1999.

Websites:
Retirement/Pensions: http://www.cnav.fr/index.htm, http://www.observatoire-retraites.org/
Unemployment Insurance: http://www.unedic.fr/, Unistatis
http://www.assedic.fr/unistatis/index.php NEW WEBSITE https://www.pole-emploi.fr/accueil/
Sickness insurance: http://www.ameli.fr/
Institut des politiques publiques (IPP): https://www.ipp.eu/en/ipp-tax-and-benefit-tables/
Statistical Compendium (Pensions): https://www.statistiques-recherches.cnav.fr/recueil-statistique-2018.html

Germany

Wages
The APW wage series pre 1979 and for 1980 and 1982 is corrected for the 1980s by averaging, and for the pre 1979 period using an index of change in private sector wage income from OECD. Wages after 2004 are based on the last APW base and % changes in the AW series in OECD Taxing Wages table (on June 2019)
Social charge rates are taken for each year from info on-line at bfa.de (on file) and Missoc tables in more recent years
Updates:
Tax and social security parameters updated using Tax/Benefit Position of Employees reports (various years) and Greif spreadsheet
Alimony allowance for single parents added to net wage calculation (Source: OECD Tax/Benefit Model, various years).
Changes to SSC deductions: in 2005 the formula for social security deductions changed, but if the previous system is the most beneficial outcome for the taxpayer, then it is applied.

Unemployment
Notes and Sources: Unemployment is set at a fixed *net* wage over the years (hence no tax calculation is needed). For couples, the net replacement rate is computed excluding the child benefit, which is then added back to the replacement rate increases to 62.5% in early 1967 and 68% in 1975 (Flora, *Growth to Limits*, p. 275.) Retrenchment begins in 1984 when the single replacement rate is cut to 63% in 1983 legislation. According to *SSPTW*, the rate is further cut in the early 1990s to 60% for singles. For families the cut is to 67% (from 68%) in 1993. Details about replacement rates and conditions in Jennifer Hunt. 1995. "The Effect of Unemployment Compensation on Unemployment Duration in Germany." Journal of Labor Economics, Vol. 13, No. 1 (Jan., 1995), pp. 88-120 and Sven Schulze. 2005. "An Index of Generosity for the German UI System." Univ. of Federal Armed Forces Economics Department Disc Paper No. 42.

Sickpay
Notes and Sources: From 1967 to 1970, the maximum amount for contribution and benefit purposes is only 900 marks/month. (This limited the benefit.) From 1961-1964 (at least) it is 660 month max. Starting in 1971, the limiting amount is raised to be 75% of the maximum pension limit. In 1997, the sickness benefit was raised to 90% (after continuation of normal wage) in 1997. Information through the 1970s is from Flora, vol. 4, p. 266. Subsequent information from *SSPTW* to 1999, and MISSOC from 2000. From 1997, the sickpay rate is 70% of gross earnings, down from 80%, with a cap of 90% of net earnings. (RR's for 26 weeks are more than 90% net because of 6 weeks 100% wage continuation) There is presumably no limit to net insurance RR in prior years.
Taxation: Income tax only payable on wage portion. Pension and unemployment contribution is paid on all of benefit, sickness insurance contribution only on the salary portion. When computations suggest replacement rate above one, the summary data replacement rates were recoded to be 1.00. From 1997, the net RR limit (90%) is decisive.

Minimum Pensions
Notes and Sources: There is technically no minimum pension. However, there is a social minimum amount that applies to all. The Sozialhilfe amounts are from *Statistisches Taschenbuch 2002* T8.16A. For couples, the additional amount is taken to be 80% of the single amount. (This figure is given in a publication, Fed Ministry of Social Affairs. 1999. *Basic Information and Data on Social Assistance 1999*)
Tax: Assumed to be untaxed

Standard Pension
The benefits of pension points in calculating the standard pension for each year from 1957-2002 is given in data at www.bfa.de (on file). Monthly benefit amount is equal to Aktueller Rentenwert times the total number of pension points accrued during work life. Annual pension points are the APW wage divided by the average insured wage. The latter was obtained from information provided from Bundesversicherungsanstalt für Angestellte (on file). For years prior to 1960, we used 1.1 as the number of pension points.
Taxation: Numerous sources indicate that the standard pension is effectively untaxed, but is subject to a sickness insurance charge (and long-term care charge (when it is instituted). Technically, interest earned from pension insurance charges over the years is taxable. Update: Starting in 2005 a portion of the pension is taxable and this portion increases gradually until it reaches 100% in 2040. However, the pension is tax free up to specific amounts. Social security charges are deductible from pension income.

Qualifying Conditions
Data is from *SSPTW* and OECD (e.g., for UE for 1995-1999). This is supplemented by MISSOC from 2000. An update to the duration and qualifying conditions for UI based on sources above. Corrections to duration for sickpay are based on 6 weeks of income included in 78 weeks of total insurance. The retirement age for men and women is that for early retirement for long careers (35 or 45 years of contributions) and not the official retirement age. The retirement age began increasing gradually in 2018 and will reach 65 for those retiring in 2029, based on data from SSPTW, MISSOC, and country sources.

Coverage
Pensions: Data for 1997-2003 from pensioner data on 65+ pensioners provided by Federation of German Pension Insurance Institutes (on-file). Figures for 1973, 1978, 1983, 1984, 1989, 1994 are estimates from the personal data files of from the Luxembourg Income Study except for 1973. 1973 data is estimated form the LIS Household file less six percent. These figures would appear to include all public funded pensions (i.e., including social pensions and civil service pension recipient) LIS and VDR surveys implicitly integrate civil servant pensioners, though they are technically under separate schemes. For 2005-2018 pensioner data from Destatis table 22611-0001 Pensions in payment (statutory pension insurance) (https://www-genesis.destatis.de/genesis/online?operation=abruftabelleBearbeiten&levelindex=2&levelid=1595451568141&auswahloperation=abruftabelleAuspraegungAuswaehlen&auswahlverzeichnis=ordnungsstruktur&auswahlziel=werteabruf&code=22611-0001&auswahltext=&werteabruf=Werteabruf#abreadcrumb)
NB: Earlier versions of the coverage rate estimated pensioners from administrative data for Arbieter, Angellstelten and Knappschaftliche retirement pensions (A,A,K) for insured, and for widows pensions in same category. Widows pensions are paid for life to dependent widows of insured persons, and were estimated as follows. First, we take the number of pensions paid to the insured and subtract disability and invalidity pensions. for A and A in 1960-1969, we

estimate the number of the disability and invalidity based on linear trends from data for the 1970s. Figures for miners, K, we do not exclude these categories. For all other years, we estimate A, A retirement pensions as those in payment to the sum of three categories of initial payment age: a) 60 , b) 63 (where relevant) and b) 65. K pensions are not broken down by age of payment, so are all used. We take the total number of widow's pensions in AAK and subtract the number of non-retirement age widow(er)s of both sexes. Data on widows is from GSY for 1962, 65, 70, 75, 80, 85, 90, 95 and 99 with interpolation in the intervening years). This result is divided by the population above retirement age: 60 female and 65 male to 1972, then 60 female and 63 male from 1973.

Unemployment: 1974-2003: *Statistisches Taschenbuch 2004*, Table 2.6A "Sozialversicherungspflichtig Beschäftigte". Data prior to 1974 from Flora, *State, Economy and Society*. Public sector not included. The number of unemployment insurance and unemployment assistance beneficiaries for all years is from *Statistisches Taschenbuch 2004*. Public employees are from the series "Beschäftigte im öffentlichen Dienst".*Sickness*: Data for all years from *Statistisches Taschenbuch 2004, 2019*. Coverage rate is for all sick fund insured-- including all voluntary members-- less pensioners.[14]

Updates:
The number of people insured for unemployment was revised and updated from 1996 through 2020 with data from *Statistisches Taschenbuch 2016-2020*. Except for 2011 and 2012 figures, which comes from the OECD's SOCR database. The number of people insured for sickness insurance was revised and updated for 2000 and 2006-2018 with data from *Statistisches Taschenbuch 2019*. Data on civil servants was revised and updated from 1995 through 2018 from Destatis and ILO estimates.
https://www.destatis.de/DE/Themen/Querschnitt/Jahrbuch/_inhalt.html?nn=64562
https://www.destatis.de/DE/Themen/Staat/Oeffentlicher-Dienst/Tabellen/beschaeftigte-ausgew-Aufg.html
https://www.destatis.de/DE/Themen/Staat/Oeffentlicher-Dienst/Tabellen/beschaeftigte-geschlecht.html
https://www.statistischebibliothek.de/mir/receive/DESerie_mods_00000140

Websites
Gabreile Moschner and Edgar Kruse, Federation of German Pension Insurance Institutes, http://www.vdr.de/
Statistiches Taschenbuch 2004 (and other years) (old link does not work)
https://www.destatis.de/DE/Themen/Querschnitt/Jahrbuch/_inhalt.html?nn=64562

[14] Compulsory insurance ceases for those earning above a certain salary. However, most people whose salaries rise above that level remain members of the compulsory sickness fund they joined when earing a lower salary. This is because they tend to enjoy much lower premiums there than they would have if they change to a new fund.

Greece

Wages

APW Wages for the years 1979 to 2004 are drawn from the OECD *Taxing Wages* series. (For missing years (1980, 1982, 1994, 1995, and 2000), estimated APW wages using hourly wages in manufacturing which were available in the ILO labor statistics database). From 2005 to present, APW wages are estimated from changes of AW wages in OECD Benefits and Wages Data. After 1987, couple household's APW wages include family subsidies. Family subsidies are provided by the employers and equal to 10% of APW wages for marriages and 5% for each of the first two children.

Updates:

Social security contribution rates, tax allowances and tax credits for years 1980-1991 were added to the net wage equations. Source: Tax/Benefit Position of Employees, various years. Starting in 2003 there is a different tax schedule for families with children. Source: Taxing Wages, various years.

Unemployment

Sources: 1971-2010 *Social Security Programs throughout the World* and 2004-2011 *MISSOC.*

Notes: In Greece, UE benefits are divided into regular UE benefits and special UE benefits. Regular UE benefits are paid to unemployed people for 5 months, if they have at least 125 days of contributions in the last 14 months or for up to 12 months with 250 days of contribution. Benefit rates are different for blue-collar workers and white-collar workers as 40% of daily wage and 50% of monthly wage respectively. An additional 10% is paid for each dependent.

Unemployed people who are not eligible for regular UE benefits can be entitled to claim special UE benefits, if they pass a means test.

In the coding sheet, we consider only regular UE benefits and assume that UE beneficiaries are blue-collar workers (40% of daily wage).

Updates:

Minimum and maximum daily amounts taken from SSPTW (1979-1999), MISSOC (from 1998) and OECD Tax/Ben Model (from 2001).

Article 5 of Act 3352/07 changed the calculation method for unemployment insurance benefits. Rather than benefits being related to previous earnings, with this reform the benefit is related to the daily wage of the unskilled worker. This change significantly reduced replacement rates for unemployment insurance benefits. Source: OECD Tax/Benefit Model

Sickness Benefits

Sources: 1971-2010 *Social Security Programs throughout the World* and 2004-2011 *MISSOC.*

Notes: Sickness benefits are equal to 50% of previous earnings. Benefit durations vary from 182 to 720 days, depending on the period of employment. During the first month of the benefit payment, the insured can have the 100% of previous earnings as sickness benefits, if he/she has worked for the same employer for more than one year. In this case, the employer will pay the difference between the statutory benefit and the employee's previous earnings. When the insured has worked less than one year, the employer will pay the difference only for two weeks. Additional 10% of benefits are paid for each dependent up to four dependents.

Minimum Pension
Sources: 1971-2010 *Social Security Programs throughout the World* and 2004-2018 *MISSOC.*

Standard Pension
Since information on wage class is not available on either SSPTW or MISSOC, replacement rates of pension benefits cannot be calculated precisely. In Greece, the rate of pension benefits is a sliding scale between 30% and 70% varying inversely depending on wage class, plus a variable percentage for each year above a threshold. A worker with a full career and average wage history was likely to get the maximum percentage and so we use this logic in the preliminary data. Based on the literature and advice of scholars we estimate the pension replacement rate as 70% of reference earnings between 1979-2004 and 80% between 2005-2018, taking into account minimum and maximum pension rules. Spouse supplements apply only to one-earned couples and are estimated for years which we lack data. Minimum pension amounts are estimated for years which we lack data by averaging between teo data points, before and after the missing year. Maximum pensions are estimated to be 100% gross wages, except in years where a nominal amount is provided. Pensions are taxed as income.
In the 2002 reform, calculation on pension benefit changed to the following formula: “years of contribution * final 5 years' average salary * inflation adjustment. According to MISSOC, each year corresponds to 2% of pensionable income. This means if pensioners have 35 years of contribution, his/her pension benefit will amount to around 70% of the final 5 years' average salary. But new calculation is applicable only to people insured since 1993. The coding sheet does not consider new calculation as it applies only to those insured after 1993 (retiring in 2028).
Sources: 1971-2010 Social Security Programs throughout the World and 2004-2019 MISSOC.

Contribution from Platon Tinios and George Symeonidis to CWEP revision:
Last revision: May 5, 2021

GREEK SOCIAL PROTECTION 1970-2020
NOTES TO ACCOMPANY HISTORICAL DATA

i. **Pension replacement rates**

General approach: To maintain comparability with other countries, the data supplied is designed to complement the data originally derived from the OECD. Information is provided for missing years (typically before 1980 and after 2016) and where the OECD information needs to be clarified, is incorrect or misleading. In those cases where OECD series are complemented, the information has been chained by applying proportionate annual rates of change.
Information is supplied for the following pension cases:

i. **Social pension. T**he pension given to urban sector indigent uninsured over 65 years of age is noted. This was instituted, subject to a means test, in 1982 and is equal to the basic Farm worker (OGA) pension.
ii. **The “typical pensioner”** is taken to be a private sector salaried worker insured in **IKA** (the ‘Institution for Social Insurance’).
    a. **Institutional Organisation:** IKA is the largest private sector throughout the period. It was set up in 1936 with the aim to gradually absorb all other pension funds providing primary insurance. After 2002 it was known as ***ETAM*** (The

Consolidated Social Insurance for Salaried workers); after 2008 it absorbed most remaining public enterprise and banking pension providers, though without altering insurance parameters. After 2016 IKA is the backbone of **EFKA** (Unified institution of Social Insurance), which also incorporated *all* preexisting primary funds as well as civil servants[15] and applied common rules for levying contributions and calculating pensions). Up to 2016 civil servants, farmers, the self employed, the media and the free professions all had separate organisations and followed different rules.

b. **Supplementary pensions.** *No supplementary pensions information is supplied.* Supplementary pension provision was more fragmented than primary pensions until 2016, when providers were consolidated into a single entity (independent of EFKA). Salaried workers who did not already belong to a provider had to be insured in TEAM from 1983. After 2016 the pensions provided is nominally NDC. In 2019 they were also incorporated organizationally in EFKA.

c. **Types of pensioner.** Three lengths of service are considered. **15 years** (4500 days of insurance, which is the minimum eligibility period from 1990[16]); **35 years** (1050 days), which until 2016 was the long service benchmark and **45 years** **(**13500 days), which is the length of service of someone starting work at 20 and retiring at 65. Note that in Greece up to 7 years can be 'recognised' as insurance periods if extra contributions are paid: military service; university studies; child rearing.

iii. **Social Pensions.** A social pension designed as a benefit for individuals not entitled to a social insurance pension through contributions was instituted in 1982. It was given to individuals over 65 who had no right (direct or derived) to a social insurance pension of their own – i.e. to those with less than 15 years' contributions. It was equal to the Farmers' (or rural) basic pension which was paid to all residents of communities under 1000 inhabitants since 1962. The uninsured individual's pension was subject to a stringent means test.

iv. **Incomes.** The OECD APW provided is followed where available. (1980-2018). For the period 1970-1979, the Bank of Greece data on weekly gross wages of production workers were used and chained to 1980. For the period after 2018, the % change in minimum pay was applied to the OECD data. Note: all private sector annual income data include *14 monthly pay packets*, including two months' holiday bonuses. Holiday bonuses were discontinued in the public sector and the civil service after 2010, though not in the private sector. (See pension calculation).

v. **The income to be replaced.** The pension application is deemed to be submitted on the 1st of January of each year. If the critical period for income replacement is two years, that refers to the *previous* two years. (i.e. if the application is submitted in year *n*, the average of *n-1* and *n-2* is used). Similarly, the replacement rate for year n is calculated using the *previous* year (n-1) in the denominator, and *not* the averaged income used to calculate the pension. The period 1970-2020 is distinguished into three phases:

a. **1970-1990:** The (unindexed) simple average of the previous two years declared income.

[15] Civil servants' primary pensions were paid through a dedicated department of the Ministry of Finance; they never had an independent pension provider. Since 2016 they have been incorporated in EFKA.

[16] Prior to that the minimum was 1050 days – 13 ½ years roughly.

b. **1990-2016[17]:** The average of the previous five years indexed using an *index of wages.* For most of the period from 2000, IKA (in an encyclical) provided the exact values to be used), for 2000-1989 the increase in the (negotiated) minimum daily wage was used[18].

c. **2016-2020.** Law 4387/16 mandates that 'career earnings' should be used. Given that electronic records had been kept from 2002 on, this in practice means all years from 2002 to the year preceding the application, *indexed for prices.* A separate sheet is appended for Law 4387.

The treatment of **holiday bonuses.** All salaried employees up to 2010 received 14 monthly pay packets, including two months' holiday bonuses. These, up to 1990, were incorporated in the income to be replaced (14 pay packets), this was divided by 12 months and the resulting pension was paid out 14 times. In this way holiday bonuses were paid out twice, and replacement rates were correspondingly higher. An end was put to this in 1990. This effect is incorporated in the calculations by dividing annual income by 14 and paying out 14 times. This implies that post-1990 replacement rates are reduced. (Replacement rates are therefore correct on an annual basis – smoothing out the impact of holiday bonuses).

After 2010 (bailout), holiday bonuses were changed to a fixed sum of EUR 800 p.a. for 2010-2012 and abolished after 2013 (when 12 pay packets are paid). It should be noted that salaried employees in the *private* (but not the *public*) sector are *still* paid 14 monthly paypackets.

vi. **The pension calculation.** In the **Pre 2016 system** replacement rates were specified through a system of classes[19]. However this complication did not affect replacement rates which remained roughly constant through the period. **15 years' contribution replacement rates** through the period were below the mandated minimum pension. The replacement rate thus follows the course of the minimum pension. This rose in the 1980s (when it was specified as a multiple of the minimum wage – from 15 to 20. It was decoupled from the minimum wage in 1990, losing out in real terms to 1996[20]. Replacement for 35 and 45 years was composed of a fixed 30% replacement plus a further replacement linked to years worked which was slightly non-linear. For 35 years the extra replacement was 40% and for 45 year 65%.

Separate calculations are shown for **different incomes** – viz at 50%, 150% and 200% of the APW. In all cases for 15 years' contribution the minimum pension exceeded the pension calculated using the pension calculation algorithm. In those cases the minimum pension is paid – a fact which characterized the entire period to 2016. Though there was a pension ceiling this was not relevant for the ranges studied. (it kicked in for income above EUR 5860 in 2017).

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[17] The increase from 2 to 5 years was implemented gradually, a year at a time. This procedure is mirrored in the calculations. 1994 is the first year where a 5-year period is used.

[18] After 2002 the best 5 of the last 10 years were used; however in the specified examples this does not make a difference.

[19] Note that the system of pension accrual was changed in 2010 for all income earned after 2013, when the pension was to have been calculated on a *pro rata* basis. However, this was never implemented. The pension system implemented after 2016 applied the 2010 reform principal to all income retroactively.

[20] After 1996 a means tested pension supplement, EKAS, to which around a third of minimum pension claimants were entitled took over the task of old age poverty relief. EKAS after 2017 was replaced by the 'Social Income' – the guaranteed minimum income.

vii. **Bailout-era cuts.** Starting from 2010 there were several cuts on pensions in payment, which cascaded on pensions with a heavier impact on pensions over EUR 1000. Lower pensions (**15 year**) were only affected through the reduction and (after 2013 abolition) of holiday bonuses. (see above). Larger pensions suffered repeated cuts with a cascading impact. *New* pension awards between 2011 and 2016 were calculated on the pre-2010 basis and were then subjected to the cumulative cuts appropriate to their respective size. (cf Nektarios et al 2017, p 60-64). The cuts imposed between 2013 and 2015 were deemed unconstitutional in 2015. Partly to comply with the court ruling a new pension system was instituted in 2016 (Law 4387) which affected all new pension awards after 2016, but also retroactively pre-2016 awards[21].
Note a pension issued in 2009 was cut repeatedly between 2010 and 2016. As cuts were applied to all pensions in payment, the replacement rates calculated for all pre-2010 years are, to that extent, considerable overestimates of *eventual* generosity, especially for the higher pensions.

viii. **The new post 2016 pensions.** Pensions issued after 2016 are composed of two tranches – (a) a 'national pension' which starts at EUR 345 for 15 years' contributions are rises linearly to a maximum fixed amount of EUR 384 for 20 years' and over. (b) a 'proportional pension' where a slightly rising accrual rate is applied to replacement income. The latter is nominally real career average income (see above).

ix. **Replacement rate.** Annual gross pension income divided by the *previous* year's income, and *not* the replacement income which is an average of several years.

x. **Net pension.** Income tax information existed for the period to 1981. Income tax was imputed for the three pension amounts for the 1970s, as well as the representative income. Equivalent calculations were performed for three other levels of income: **50% APW, 150% APW and 200%APW.** Three tax regimes are captured 1970-71, 1972-4 and 1975-1981. The tax liability calculated is that for a single pensioner with no dependents, with no other sources of income. The earned income allowance (common to both salaries and pensions) has been applied throughout. <u>Net replacement rates involve net pension amounts divided by net income of the previous year</u>.

Taxes and other family matters

Tax treatment of pensioners. Pensioners are treated in all respects as salaried employees. Hence tax liability is identical to a salaried employee with the same income. In the bailout era a number of 'solidarity surcharges' were imposed on total declared income. These applied equally to pensions. Solidarity payments imposed on pensions specifically are included in the pension cuts referred to previously.

Pensioner couples (where both spouses are receiving pensions) are treated identically to double earner couples – each income is taxed separately and is entitled to the earned income allowance. Family income in the case of earned income such as pensions is *not* aggregated.
Pensioners social insurance contributions. Pensions since the mid-80s are subject to a 6**% social insurance contribution for healthcare insurance.** Since 2016 this is applied to all pension income (including supplementary pensions). Note that employees pay 6.45% in total for health in kind (2.15% worker and 4.30% employer).

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[21] The difference between 'old system' calculations and the recalibrated 'new system' pensions was termed 'personal difference'. This was due to be abolished after 2019, though that provision was repealed. The personal difference is due to be gradually abolished by not being adjusted for inflation after 2022; given prevailing inflation rates this reduction is likely to be theoretical.

Pre 2016 Family supplements for non-working spouse.
For the **period before 2016**, a fixed amount equal to 1.5 daily minimum wages was added for a non-working wife. **For children** the pension is increased by 20% for the first child, 15% for the second, and 10% for the third. No further increase is granted beyond the third child. A child is an unmarried non-working person under 18 or under 24 if in full time education. Especially in the case of the **minimum pension,** that is increased by 1.5 minimum daily wage for the spouse and 1 daily wage for each child up to a total of three children[22]. This definition was not changed when minimum pensions were de-linked from the minimum wage in 1992.

EKAS. For the period 1996-2020 a means tested supplement to pensions, EKAS, operated especially for pensioners as a kind of guaranteed minimum income. This was a fixed amount granted on three sets of income and wealth criteria, both for the individual and the household. It and was designed to aid minimum income pensioners with no access to supplementary pensions. (The income test excluded people in receipt of minimum pension and a minimum supplementary pension.). **EKAS has *not* been calculated for our examples** (It is estimated that between 20 and 50% of individuals with 15 years' contribution would have been eligible for the supplement. EKAS was abolished in 2020, when pensioners became eligible for the general guaranteed income.

The post 2016 system: a consolidated system based on a simpler algorithm
The system for calculating pensions was changed after 2016; a minor amendment affecting replacement rates for long service periods was passed in 2019. Monthly pensions are calculated in three steps:

1. **The National Pension**. All persons with more than 15 are entitled to a fixed sum. This after 20 years' contribution is constant at 384 EUR. It is reduced by 2% for each year less than 20 (for 15 years it is EUR 345.60). It should be noted that according to the 2016 the national pension is paid for through government grants independently of contributions.
2. **The critical income to be replaced**. Career average – all years count since 2002 (when full electronic records exist). Each income is transformed into constant prices of the year in which the calculation is performed (i.e. the previous year) by using a conversion factor based on the retail price index[23]. In practice, the main pension provider issues a table containing the conversion factors to be used and this is applied mechanically. The table employed in 2010 assumes no price change since 2008, which is approximately correct; in years when prices fell which was the case 2013-2019, the price change imputed was zero.
3. **The contributory pension**. An annual accrual rate is applied to the average critical income[24]. This rises slightly with career length. The average rate is noted in a separate table. No contributory pension results for careers under 15years. The marginal annual rate

[22] Note: the system of minimum pensions and the size of pensions was changed in 1992 for people first insured after 1993. However, this was changed in 2016, so a person fulfilling the characteristics of the examples calculated would have been subject to the pre-reform provisions.
[23] Up to 2016 a wage index was used, but that was abandoned in favour of the RPI. As wages fell during the crisis, persisting with a wage index would have *reduced* incomes and led to lower pensions. In practice, the main pension provider issues a table containing the conversion factors to be used and this is applied mechanically.
[24] Incomes are first averaged and then the accrual rate is applied, implying that the age-income profile has little impact.

starts at 0.84%, rises sharply after 30 years' career to a maximum of 2.55% and then drops to 0.50% after 40 years' career.

Pensions are calculated as the sum of the national pension and the contributory pension. No family or dependents' supplements are added. However pensioners are eligible for the general system of (means tested) family support.
Pension indexation. All pension indexation has been suspended until 1 January 2023. After that time the provision of the 2016 law will be applied: pensions are indexed by a factor weighting 50% the percentage rise of the RPI plus 50% the change in nominal GDP, but no greater than the rise of the RPI.

Qualifying Data
1971-2010 Social Security Programs throughout the World and 2004-2018 MISSOC.

Coverage
Pension coverage: Statistical Yearbook of Greece, various years through 2010.
http://dlib.statistics.gr/portal/page/portal/ESYE/categoryyears?p_cat=10007369&p_topic=10008097
Unemployment and Sickness coverage: we use a proxy value for these indicators based on labor force statistics (Labor force – Self-employed – Unemployed)/Labor Force. Source: OECD.

Hungary

Unemployment
Earnings related scheme.
Liable to income tax. Benefits are liable to social contributions, but from till 2004 only liable to pension contributions.

Sickness insurance
Contradictory information from MISSOC and ISSA; we rely on MISSOC also for previous years and take the benefit to be calculated on the basis of average daily *gross* earnings. Additionally, we take that the employer is to pay 80 % of the daily average daily gross earnings in the first 15 days of illness (ISSA does not give any indication on this). No changes during 1995-2010.
From 1995 to 2000 subject the benefit is subject to social security contributions; from 2001 until 2010 no social contributions. Fully taxable.

Minimum pensions
Means-tested old-age allowance for people not eligible for a regular old-age pension. Single persons receive an amount equivalent to 95% of the social insurance minimum pension, for couples the amount per capita is 80% of the social insurance minimum pension.
Not liable to taxation and social security contributions.

Coverage
Sickness insurance coverage: Number of persons entitled to sick pay. Data was kindly provided by Zoltán Tajti/László Csonka, National Health Insurance Fund Administration (Department of Statistics and Operational Analysis; Email, December 7, 2011).
Unemployment insurance coverage: Estimation; total number of employees (all employed have to pay contributions), Hungarian Central Statistical Office, www.ksh.hu

National sources and acknowledgements
National Tax and Customs Administration of Hungary (NTCA)
Additional information regarding benefit thresholds and method of calculation of unemployment benefits for the time period between 1996 and 2003 was kindly provided by Róbert Komáromi from the National Employment Service of Hungary.

Ireland

NB: Unless otherwise stated, Irish benefits before 2003 are from the Irish on-line statutes. Some additional information was taken from communications (on file) with Irish Welfare Office. Amounts are those payable as of April 1 of the year in question. Tax information back to 1975 is taken from a table provided by the Tax department of Ireland (on e-file). Pre-1975 tax data are from OECD Taxing Wages.

Wages

Wage information for 1980 and 1982 and before 1979 appears to come from male APW wages. Adjustments were made based on the Irish CSO earnings back for 1973-1978, 1980 and 1982. 1979 used as the base for computing backwards. 1970-1972 were estimated using an index of average weekly earnings in the *Statistical Abstract of Ireland*. Post 2004 wages from estimated from APW base and changes in the OECD AW series.
Update: The Universal Social Charge (USC) was introduced in 2011 and replaced the Income and Health Levies. Social contributions before 1979 consisted of a flat-rate portion and an income-related portion. These have been updated for 1975-1978 (Source: Hughes 1985, 10)
Update: Taxes since 1995 were re-evaluated with the exempt income/marginal tax relief rules

Unemployment

Sources: All information and data are from *SSPTW*, *MISSOC*, and Department of Social Protection.
Notes:. Jobseeker's benefit (before September 2006, called UE benefit). From 1973 to 1995, unemployment benefit consisted of a flat rate and earnings-related portion, which was initially 40%, but cut to 25% in 1982 (effective 1983) and then to 12% effective in 1987. It was suspended in 1994, but paid to people becoming unemployed up to late 1994.
Taxation: According to the Irish authorities, UE benefits are *taxable* income. However, with the ER portion removed (pre 1973, post 1995), the flat rate portion is below the exemption limit. Not subject to social contributions.
Update: Child supplements to unemployment benefits are not taxable. Lone parent households in receipt of the One-Parent Family Payment (OFP) are eligible for half of the Jobseeker's benefit personal rate and no dependant's allowance.
Update: Taxes since 1995 were re-evaluated with the exempt income/marginal tax relief rules

Sick pay

Sources: All information and data are from *SSPTW*, *MISSOC*, and Department of Social Protection.
Notes: A calculation for sickness benefits is equal to that of jobseeker's benefits.
Duration of payment is unlimited, if the insurer has over 260 weeks of contributions until January 2009 (MISSOC), then 104 weeks. A shorter qualifying period is 104 weeks for 52 weeks of payment in 2010.
Taxation: Sickness benefits are taxable. Not subject to social contributions.
Update: Taxes since 1995 were re-evaluated with the exempt income/marginal tax relief rules

Both unemployment insurance and sickness insurance are funded through the pension charge in all years.

Pensions
Sources: Rates for non-contributory pension and spouse supplement (the minimum pension), and payments for spouses under contributory (standard) pension are from the Irish Welfare Ministry. Single rates include the living alone allowance where applicable (this is estimated for most even numbered years).
Standard Pension: the State Contributory Pension (before September 2006, called the Old Age Contributory Pension) is paid to people from the age of 66 who have enough social insurance contributions (coverage beginning before age 56 and at least 260 weeks of paid contributions). The contributory pension can be paid regardless of other income, and it will be untaxed when the pension is the only income.
Contribution rates are different depending on the wage level. We compute contribution rates using 100% APW wages.
Minimum Pension: the State Non-Contributory Pension (before September 2006, the Old Age Non-Contributory Pension) is a means-tested payment for people age 66 or over, who do not qualify for State Contributory Pension on their record of social insurance contributions. The non-contributory pension is not taxable.
Taxation: All amounts (min or standard) are below the pension income limit (or assumed to be so before 1975). No social contributions are charged on pension income (Source: MISSOC: 1998-2018)

Qualifying Conditions
Largely from Statutes, but also SSPTW. NB: The social charge under sickness from 1979-1992 is for health care, not sick pay. SSPTW notes that sickpay is funded through the pension charge in all years.
Pension: The system of contributory pensions was put in place in 1952, and the average number of insured weeks for "full coverage" (48) counts only years from 1953. An additional provision in the 1952 law was coverage from age 60. In 1992, a reform made the test for full benefit an average of 48 months of coverage from 1979, and entry into insurance from age 56. Thus, the required number of years of "full coverage" is only 12 in 1993 (1993-1979)*48/52, and rises from 12 in subsequent years based on this later start date.
Sickness: waiting days represent those for receiving the earnings-related benefit, when such a benefit exists. Conditions for sickness are those surrounding access to the unlimited benefit. (A shorter qualifying period exists for a much shorter benefit, but a our notional worker is assumed to have qualified for the longer benefit.) Sickness qualification and duration also assume that the benefit paid without limit is the earnings-related one.
UE: Qualifying period and length of benefit is derived from amendment according to the online Irish Statute Book http://www.irishstatutebook.ie. A person with 39 weeks of insurance qualified for (including the ER portion) up to 65 weeks (1.25 years) of benefits. Until the 1991 Social Welfare Act amendments, a person needed 48 weeks of contributions to qualify for full (65 weeks) of benefits. From then, a person with at least 39 weeks of paid contributions could receive jobseeker's benefit (and any ER allowance) for that period. In 2003, the benefit conditions were tightened. The benefit length was cut to 312 days (52 weeks) for those with basically between 39 and 260 weeks of contributions; In 2008, another reform decreased benefits further. First, the minimum qualifying period was effectively raised to 104 weeks. Second, the maximum duration was cut from 390 to 312 days (65 to 52 weeks) for those with over 260 weeks of contributions. Third, the maximum for those with between 104 and 260 weeks of contributions fell from 312 to 234 days (52 to 39 weeks). Our coding assumptions in CWED code it as 260 weeks to qualify (from 2004) for a benefit of 65 weeks until 2008 (then 52 weeks).

Coverage:
Until 1979, there are three sources of data on insurance coverage: social insurance cards, Social Insurance stamp sales, and "effective coverage under the social welfare acts." After 1979, the system switched over to pay-related social insurance coverage.
Differences between the three are often large. What Flora counts as coverage for UE and sickness is the "New and Exchanged" Insurance Card figures. These are reasonably close to the definition of coverage given in the SSPTW description only if public employees are counted as having the cards (the description in the *Abstract* is vague on this point.) What Flora counts as "insured for pensions" is equal to the estimate for "effectively insured" given in the *Statistical Abstract*. However, it is not clear what assumptions are made for this table. The final category is "average weekly number of persons in insurable employment", which is based on number of insurance stamps sold. This figure is much lower than either of the other two. Since employees need weekly stamps to be credited with insurance, this would seem the most accurate estimate of those actually paying. However, the existence of unemployed, casual labor, and other factors make it possible that this method of counting is flawed.
UE/sickness: From 1955-1978, total number of exchanged and issued social insurance cards. 1983-present: Payers of type A social insurance. Source for years through 2003 from *Statistical Information on Social Welfare Services 1985, 1990, 1995, 1999, 2003* (interpolated for some years)." Increased coverage from 1996 due to a) incorporation of new public employees b) decline in unemployment.
Unemployment benefit and assistance recipients and live register (unemployment) data refer to levels on the last Friday of April in each year up to 1980, and after that to annual average based on monthly returns.
Pensions: beginning-1975: Contributory, non-contributory, retirement, and widows pensions from *Statistical Abstract of Ireland*. 1976-2010: these same data plus pre-retirement pension from *Statistical Information on Welfare Services*. Civil Service pensions are from unpublished data provided by Irish authorities. Unless noted (recent years), widow's pensions for those over retirement age are estimated as total widow's pensions times the portion of all widows in the Irish Censuses who are: female, widowed, and above pension age. From 2011-2018 data are for total number of pension recipients from the Department of Employment Affairs and Social Protection (http://www.dsfa.ie/en/Pages/Annual-SWS-Statistical-Information-Report.aspx). Retirement age for calculations are 70 years between 1971-1983, 65 years between 1984-2013, 66 years between 2014-2018. Population by year of age from Central Statistics Office (https://statbank.cso.ie/px/pxeirestat/Database/eirestat/Annual%20Population%20Estimates/Annual%20Population%20Estimates_statbank.asp?SP=Annual%20Population%20Estimates&Planguage=0)

Acknowledgements

Websites
Department of Social and Family Affairs, http://www.welfare.ie/
Annual Social Welfare Services Statistical Information Reports Index, http://www.welfare.ie/en/publications/annstats/Pages/index.aspx
The Portal to Ireland's Official Statistics, https://www.cso.ie/en/index.html

Italy

Wages

APW series pre 1985 reported by OECD is problematic on several grounds. Because Italy uses an all-production worker basis (not males only) for computing wages from 1972-1978 (and 1980 and 1982), its series should be consistent; i.e., no small increase in 1979, then large jump to 1980, small jump to 1981, etc. Yet the wages reported are quite out of line. Indexed changes in the 1970s from different wage sources suggest that OECD APW data are inaccurate. They show an increase of 15% in 1973-4, 51% from 1974-5, 11% in 1975-6, and 19% in 1977. Available wage indices from SAF, OECD, and BLS all suggest a much smoother path for wage increases (circa 25%, 25%, 20%, and 25%, respectively. Since wage changes were frequent in this period in Italy and inflation high, it is likely that the OECD APW data do not reflect the truly smoother series due to indexation. We use the wage changes from the OECD business wage rate index to estimate an index from 1974-1977. (Note that the result of doing this results in an almost identical series from either a 1979 OECD APW (adjusted as in next para) base or a 1973 OECD APW base.

The second issue is APW wage reported from 1979 to 1984. The OECD sources report a wage on the family column that is lower than on the singles table. The explanation implies that the data reported by the Italian authorities included family benefit in the gross wage. If so, *why weren't single wages adjusted downward as the family benefit was untaxed payment to families*!! (We have no information to suggest that families received lower wages in this period compared to singles.) We attempted to correct this by subtracting the family benefit from the wage reported in years 1979, 1981, 1983 and 1984 (all years in which this odd reporting took place), and adding it back in the net wage for couples with children calculations. This produces a gross APW series that corresponds more closely to wage trends from the other sources. Finally, for 1974-1984, we re-estimated net wages from the available tax structures or imputed them in missing years. Up to 1985 family benefits are considered flat rate and taken from OECD sources. Missing years are inputed with an estimated value based on available reports. From 1986 family benefits vary with income and are taken from OECD and government sources.

APW wages after 2004 are estimated from change in the Taxing Wages AW series.

Taxes: For unemployment and sick pay, I have included the deduction for dependent workers in deductions. The bottom bracket rate for 1984 and 1985 is missing. It is imputed from the tables to be 18%.

Update: basic tax credit scheme has been updated (corrected to being based on taxable income rather than taxes due). From 2014 there is a new tax credit scheme applicable to low earners called the Fiscal Bonus. Added additional tax credit for lone parent households. Spouse tax credits are based on income. These have been updated.

Unemployment

Sources: Benefit data are from *SSPTW* and MISSOC.

Notes: The main table reports the *ordinary* benefit system. The more generous systems ("special", "wage supplement" until the mid 1970s, "special"/"mobility" insurance since the mid 1970s) have generally higher replacement rates, qualifying periods, benefit durations, and are restricted to certain types of employees. The higher replacement rates are provided in a

second table (after the table for the United States). The more generous system makes one ineligible for family benefits.
In the 1989 reform, the unemployment insurance system moved from a flat rate to earnings-related system. The first net replacement was 15% in 1989, but it has gradually increased to 20% in 1992, 30% in 1996, 40% in 2002, 50% for the first 6 months and 40% for the 7th month in 2006, and 60% for the first 6 months and 50% for the 7th and 8th month in 2008. Another reform occurred in 2011, beginning implementation in 2013 and fully implemented by 2017. The replacement rate is 75% of wages up to a maximum wage and then 25% of wages above the specified maximum, capped by a maximum benefit. In 2017 this amount is reduced by 3% from the fourth month of benefit. Another result of the reform was that the duration of benefits was now equal to half of the insured weeks in the previous 4 years, with a maximum of 24 months of benefits.
Tax: Benefits are taxed as normal income. Social contributions are typically not assessed on benefits replacing less than 80% of wages (OECD Tax/Ben Policy Descriptions)

Sick pay
Source: SSPTW (corroborated by Flora, *Growth to Limits* for overlapping years).
Notes: It is assumed that there is no benefit ceiling as there is no indication of one in any material we reviewed. Salaried employees (or managerial employees later) are not insured; it is not clear whether they are essentially covered by employers.
Taxes: benefits are assumed to be fully taxable for income but not for social insurance contributions.

Minimum Pensions
Source: The source for the amounts is the INPS (data on file).
Notes: Monthly rate given is paid 13 times a year, with the benefit doubled for couples. It is income tested, and computed for someone who is 65 or older.
Taxes. They are presumed to be untaxed for all years.

Standard pension
Notes and Sources: Benefits up to 2015 are on old system rules. Benefits computed as if retirement at 65 up to 2011, 66 from 2012-2015, and 67 from 2016-2020.
Until the 1983 SSPTW (presumably from the 1981 reforms), there is no mention of any earnings revaluations in calculating the wage on which the pension is based. In 1983, it mentions revaluation for changes in "cost of living." The 1987 SSA states that only the first three of the last five years (used to compute the average wage) is revalued for changes in the cost-of-living. The Eurostat pensions study also revalues wages for CPI when computing benefit. This remains until the major reforms of 1995, which change the calculation basis considerably. Hence, prior *to 1982, past wages are not revalued and after they are revalued by the CPI.*
CPI updated using the following sources:
http://seriestoriche.istat.it/index.php?id=1&no_cache=1&L=1&tx_usercento_centofe%5Bcategoria%5D=51&tx_usercento_centofe%5Baction%5D=show&tx_usercento_centofe%5Bcontroller%5D=Categoria&cHash=301d8d2ef0ecc8d2aa9fc6ed174d1d9d
https://www.istat.it/en/prices?data-and-indicators
There have been several reforms of the pension system (1992, 1995, 1997, 2004). The major Dini reform (1995) changed the system from DB to DC rules. However, since the system was phased in over time, only those retiring in 2015 were affected by the change in rules. Those retiring in 2015 and on were in a mixed system where benefits were calculated according to

different rules for different contribution periods. Benefits for contribution periods before 1996 were calculated under the old DB rules and for contribution periods from 1996 on benefits were calculated under the new DC rules. The rules were applied in proportion to the working life spent under each system (out of 45 years). This resulted in a reduction in benefits.
DB rules: Average pensionable wage x accrual rate x 40 years
DC rules: Sum of contributions since 1996 x 5-yr moving average of GDP growth rate x transformation coefficient based on age of retirement
Source: Marano, A., 2006. Pension Reforms in Italy. *Revue française des affaires sociales*, (5), pp.223-252.
For tax purposes, the pension is considered to be earned income, i.e., eligible for deductions or credits that a wage earner receives, but fully subject to income taxation. However, the pension is not liable for social contributions until Jan 1991 (according to a Eurostat study) when a pensioner health insurance tax equal to that paid by workers is put in force. (This charge is payable only if pension was 18 Mil lire in 1991.)

Qualifying Data
1971-2010 Social Security Programs throughout the World and 2004-2018 MISSOC.

Coverage
Pension: coverage was not computable from official stats for most years since so many receive a pension. However, detailed data from ISTAT for 2000 permit an estimate of pensioners over 65 that does not double count. It suggests that there is full coverage (for over 65) if one includes public pensions, civil service pensions, survivor's pensions. Estimates in various years from 1985-2000 from the Luxembourg Income Study household file also suggest full coverage. We assume full coverage for years following the introduction of the means-tested social pension in 1969. It is paid to those over 65. However, it is not clear how many women actually depend exclusively on their husband's pension, as there is no explicit supplement for dependent spouses in the system. Civil servant pensions are implicitly included in coverage as it is based on the LIS surveys.
Unemployment: Data through 1980 are from Flora, vol 4, p. 522. (Not sure where the figures come from). We have not been able to find estimates for later years …
Sickness: Estimate is employed dependent labor force for all years. (For 1950-1980, this matches Flora's estimates in *State, Economy and Society*)

Acknowledgements
INPS, amounts of social pensions since inception

Japan

Wages
The APW wage series tracks reasonably closely to the nominal wage index constructed from the *Japan Statistical Yearbook* (e.g., 1998, p. 121, Table 3-37) between 1976 and 1995. (This is a bit surprising. That source shows some divergence between that index number and the one for manufacturing-same Table—though OECD claims that the latter mfg index is used. After 1995, we stayed with the OECD APW.) Before 1976, we used the nominal wage index (from JSY) to estimate nominal wages.(Difference from the OECD APW may well be attributed to the use of male, rather than male and female wages, but we are not certain.) APW wages include bonuses, which are not counted as wages for benefit purposes in most cases (except where noted). The percentage of APW that is bonus was estimated using the differences between reported in contract earnings (i.e., excluding bonuses) as total cash earnings (i.e., incl. bonuses) reported in *the Japan Statistical Yearbooks* wage basis for benefit=(APW*(Basic Pay/Total Earnings). The amounts demonstrate that bonus pay has tended to decline over time. The wage used to compute the benefit calculation is 75% of APW up to 1990, 80% to 1999, and 85% from 2000.
Post 2004 wages estimated from the APW based and change in OECD's AW series in Taxing Wages.

Unemployment
Sources: SSPTW and Ministry of Welfare
Notes: Until the reforms in the early 1980s, bonuses were counted as wages for benefit purposes according to the Japan Labor Institute (on file). (This mirrors a drop seen in the OECD Jobs Study Tables on net replacement rates for different worker profiles.) Thus, before the 1984 reform, the replacement rate is applied to the entire APW. After that, it is applied only to the estimated contractual salary (i.e., excluding the bonus).
From 1985, the net replacement rate is estimated to be 63% for an average wage earner. The actual rate is a sliding scale between 60% and 80% based on a formula that is unavailable for years before 1994, according to the Employment Insurance authorities.
Daily average wage minimum and maximum amounts are from OECD Tax/Ben from 2001.
Tax: Benefit is taken as not taxable for all years

Sick pay
Sources: *SSPTW*
Notes: Sick pay replacement rates are assumed to operate (per communication with the Labor Institute) on the basic wage (excluding bonuses). Thus the change in replacement rates reflects the change in presumed bonus payments (above), plus any tax changes.

Minimum pension
Source: Benefits paid under National Pension Plan after 1971 as given in SSPTW. Pre-1971, it is the social assistance amount given in the SSPTW.
Notes: National Pension Plan rates are doubled for couples. The plan is nominally contributory, but "compulsory for adults not covered by other plans". Benefits are the amounts payable for someone covered since coverage became compulsory in 1959. (This means that the full NPP amount is not paid until 1999. It is not clear that spouses of covered employees had to contribute.

Taxes: These amounts are untaxed for all years

Standard Pension

Notes and Sources: basic amounts and formulae from *SSPTW*, wage index from Japan Statistical Yearbook, and all-item CPI from Ministry of Finance. Calculation details are explained below.

Major pension reforms occurred in 1985/6 and in July 1999.

Maximum insurance period is counted only from the reconstituted program in 1954.

The base amount for 1961 and 1964 in SSA is assumed to be a typo. Based on all accounts, the benefit seems as if it should be 200, not 2000

Prior to 1974, there was no indexation of past wages. Between 1974 and 2000, revaluation of past earnings was based on CPI every four years, and wage growth every fifth year. ("Every fifth year" effectively means that past wages were eventually adjusted for wage growth.) Since 2000, revaluation is based only on price inflation.

The jump in benefits in 1975 is consistent with Horioka's (1997, p. 177) claim that replacement rates were went from being modest to being comparable to other developed countries in 1973 legislation. Prior to 1971, NPP minimum contrib. pension was 10 years, so no benefits are given to the enrolled spouse.

1986 reform: In the 1986 reform, the accrual rate is gradually reduced from 1% to .75% per year of coverage, thus requiring the contribution period for full benefit to grow from 35 to 40 years.

The 1986 reform had the effect of making a wife entitled to a basic benefit without contributions (which were presumably paid to the Employee Plan by the husband), and of reducing benefits (both the flat rate part for employees and the ER percentage). Thus, in the tables from 1986, the basic benefit is doubled for the notional couple.

Transition regime from 1985 reform. From 1986, the earner is considered to get the full NPP (they are credited with full coverage if covered under the EP prior). In earlier years, the Employment Insurance (ER) program amounts in *SSPTW* include any benefit payable via NPP. Before 1986, the spouse is considered only partially covered by NPP (since inception). After, the spouse is credited with full payment.

A 1994 reform shifted from gross to net wage as the basis for adjusting benefits in payment. Takayama notes that the system allowed those with less than 40 years of coverage, but covered since the start of the program, to get the full KN (i.e., NPP) benefit.

1999 reform: The 1999 reforms involve a number of changes in retirement age, earnings tests for pensions, and adjustments to pensions in payment. The things affecting the calculation of benefits at retirement are a) the accrual rate falls from .75% to .7125% from 2000, and b) bonuses are included as wages for benefit/contribution purposes from 2003.

Taxation: In principle, public pensions are taxable, but there are special deductions for pension income. It is assumed throughout our estimates that deductions render the pension untaxed. (This seems consistent with anecdotal claims in the literature for APW; it's validity for 2*APW is less clear.)

Coverage

Pensions: *Japan Statistical Yearbook*. 1960-4: combined national pension, welfare annuity and seaman's pension recipients; 1980-1990-5, combined totals for old and new systems. Number insured for pension is the sum of Welfare Annuity Pension, Welfare Annuity Fund, National Pension, and Farm Workers Pension for 1960-1971, then total number of insured for 1974-present. Figures for pension take-up appear to include civil servant and military pensioners

Unemployment: *Japan Statistical Yearbook* various years, from Chapter on Social Insurance. (includes seaman's insurance). Includes number of insured persons plus recipient data for average monthly number of beneficiaries in the fiscal year under programs for standard basic allowance and insurance program for day laborers.
Sickness: People insured for Employees sickness insurance only (National Health Insurance carries no certain right to sick pay) *Japan Statistical Yearbook*.

Qualifying:
Sickness: 18 months duration specified in *SSPTW* for1971-1975 applies only for tuberculosis victims. From 1977 on duration is 18 months without specification of illness.
UE: *SSPTW*, Japan Labor Institute. Change in duration (to 210 days of 365, approx 30 weeks) is taken as the effective from 1975. Change in duration (to 180 days of 365, approx. 26 weeks effective in and to 150 days in 2003. The government also created a facility to give more benefits to those who were difficult to place in jobs; however, this is discretionary.
Pensions: *SSPTW* Qualifying period taken for full ER benefit and from reconstituted program (1954).

Sources
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Republic of Korea

Wages
The APW wages have been estimated based on the sum of monthly total wages (regular payments + overtime payments) for all occupations reported in the *Survey Report on Occupational Wages* (1971-1992). *Year Book of Labor Statistics* (1993-2008), and Survey Report on Labor Conditions by Employment Type (2009-2019).

Taxes
The APW tax is taken directly from the *OECD Taxing Wages* series, but the data are not available before 1995 since South Korea joined the OECD in 1996.

Unemployment
Sources: SSPTW and Employment Insurance White Paper
Notes: The employment insurance system was implemented in July 1, 1995, and unemployment benefit began to be paid after the late 1996. The employment insurance system only covered companies with 30 or more employees at first. However, due to a rapid increase in the number of unemployed people during the late 1990s economic crisis, its coverage was extended rapidly within one year, 1998. It covered companies with 10 or more employees in January, 5 or more employees in March, and finally 1 or more employees in October 1998. In addition, qualifying period was shortened from 1 year to 6 months and duration of benefit was extended. At the same time, because of sharp increase in payment for unemployment benefit, the rate of contributions also increased from 0.6 percent to 1.0 percent of the total payroll in October 1998. After the Korean economy recovered in 2002, the contribution rate dropped to 0.9 percent in December 1, 2002.
Unemployment benefit is equal to 50 percent of the insured's average salary during the last three months before unemployment. There is a ceiling and a minimum (70 % of the minimum wage at the time of unemployment) for unemployment benefit.
In all cases, benefits are known to be untaxed, and there is no family benefit for UE.
All data and information are from *White Paper on Employment Insurance* published annually by the Ministry of Employment and Labor.
The coverage rate reflects the number of insured workers as a percentage of the lablor force. This is different from the figures reported by the Ministry of Employment and Labor as those reflect the number of insured as a percentage of wage workers.

Sickness
There is a national health insurance program, but no sickness benefit in that program.

Minimum Pension
Sources: SSPT and National Pension Statistical Yearbook
Notes: In 2008, Korean government introduced the Basic Old-age Pension. The basic old-age pension system grants a monthly fixed pension benefits to those who are 65 years of age or over and have little income and property (the bottom 70 percent). The flat rate benefits are equal to 5% the average of the price-indexed average monthly income for the last 3 years (gradually rising to 10% by 2028). Basic Pension was introduced in 2014. It is paid to a person with at least the age of 65. There is no requirement to contribute, but to be recipients of Basic Old-age Pension, they should not be covered by National Pension scheme and their

asset/income level should be lower than criteria of Old Age Pension Law and regulation. The maximum benefit is equal to about 10% of the three-year average earnings of the insured of the National Pension. The benefits are not taxable and couple rate is 80% of single rate each.

Standard Pension
Sources: SSPTW and National Pension Statistical Yearbook
The National Pension was established in 1986 and became effective in 1988. When the pension was first introduced, it covered only those working in workplaces with 10 or more full-time employees. Since then, the pension has been continuously extended to cover workplaces with 5 or more full-time employees (1992), farmers & fishermen (July 1995), urban citizens (April 1999), and workplaces with 1 or more employees (July 2003), eventually becoming a pension scheme for the whole general public.
Even though the coverage for the pension has increased, benefits have decreased and will continue to decrease. The formula to calculate pension benefit was 1.32(A+B)×(1+0.05N) in 2020. [1.32] refers to a proportional constant used to decide the income replacement rate of the insured person with average income. Until 1998, the proportional constant was 2.4. From 1997 to2007, it was 1.8. After 2008, 1.5 will be reduced 0.015 every year until 2028. By 2028, the indicator 1.5 will have decreased to 1.2.
[A] is the average of the price-indexed average monthly income for the 3 years prior to pension payment. The ministry of Health & Welfare publishes the amount of [A] every March 1. The amounts of [A] are from *National Pension Statistical Yearbook*.
[B] is the amount of average monthly income of an insured person during his/her insured period. This is the earnings-related element adjusted into the value of the year prior to pension payment. The revaluation is based on the fluctuation rate of [A].
[0.05] represents an additional annual rate (5%) for the insured period exceeding 20 years.
[N] represents the number of insured years beyond of 20 years. Each month is calculated as 1/12 year.
Pension benefits are computed using earnings history since 1988. However, until 2007, no one fulfilled an insured period of 20 years. So, until 2007, coding sheets computed pension benefits as the reduced old-age pension. This means that replacement rates until 2007 are lower than the full pension benefit. Pension benefit of less than 20 years contribution has been reduced 5% per year below 20 years. The reduced old-age pension is paid to a person whose insured period is more than 10 years and less than 20 years and who reaches the age of 60. (This means that the National Pension amount is not paid until 1998. If the insured period is less than 10 years, the National Pension benefits are paid as a form of a lump sum)
Dependents' Pension Amount is from the *National Pension Statistical Yearbook*. A fixed amount is paid to the dependents regardless of the average monthly income and insured period.
All benefits of pension are untaxed.

Qualifying Data
SSPTW
UE: Employment Insurance White Paper
Pensions: National Pension Statistical Yearbook

Coverage
Ministry of Health and Welfare Yearbook

Pensioners: Pension coverage counts all beneficiaries of old-age pension, civil servant pension, private school teacher pension, military pension, and special post office pension. *Unemployment:* In UE coverage, civil servants are excluded from the labor force. Civil servants are not required to make contribution to the Employment Insurance System, and not covered by the system. But their lifelong employment is guaranteed.

Acknowledgements and other sources
Yunmin Nam, Research Professor, Institute for Welfare State Research, Yonsei University

Latvia

Unemployment
Earnings-related benefit scheme. Benefit replacement rate is graduated according to the length of the social insurance record.
Neither taxes nor social security contributions.

Sickness insurance
Earnings-related benefit scheme.
Fully taxable. No social security contributions.

Minimum pensions
Persons not eligible for a regular social insurance old-age pension receive the "State Social Seucrity Benefit".
Not liable to taxation and social security contributions.

Coverage
Unemployment insurance coverage: number of working age contributors to an unemployment benefit scheme (ILO SSI)
Sickness insurance coverage: number of working age contributors to a sickness benefit scheme (ILO SSI) (the same as for unemployment scheme)

National sources and acknowledgements
Information on tax rates: Valsts ieņēmumu dienests VID (2011).
http://www.vid.gov.lv/default.aspx?tabid=8&id=2982&hl=2
Information on tax allowances: http://www.vid.lv/lv/informacija/indeksi

Lithuania

Unemployment
Prior to 2005 the benefit was determined by a formula consisting of three elements: the State Supported Income, the Minimum Living Standard and the length of the social insurance record. Since 2005 the unemployment benefit consists of a fixed and a variable component. The fixed component is defined by the State Supported Income. The variable component is related to former earnings.
Not taxable. No Social Security Contributions.

Sickness insurance
Earnings related scheme.
Benefits subject to taxation. Not liable to social security contributions.

Minimum pensions
Persons not eligible for a regular social insurance old-age pension due to an insufficient insurance record receive a social assistance pension which is equal to 90% of the Social Insurance Basic Pension (*bazinė pensija*).
Not liable to taxation and social security contributions.

Coverage
Data on number of persons covered by the state social insurance, State Social Insurance Fund (SoDra) under the Ministry of Social Security and Labour, "Reports on the Activities of the State Social Insurance Fund Board" (http://www.sodra.lt/index.php?cid=2874 and http://www.sodra.lt/index.php?cid=13555). The compulsory state social insurance covers both sickness and unemployment cash benefits.

National sources and acknowledgements
SoDra (State Social Insurance Fund Board of the Republic of Lithuania)
Data on child allowance payments was kindly provided by Mariana Ziukiene from the International Affairs Department of the Lithuanian Ministry of Social Security and Labour.
Benefit rates for minimum pensions: http://www.sodra.lt/index.php?cid=283 (available only in Lithuanian)
Income taxes and allowances: 2003 Law on Income Tax of individuals: Seimas of the Republic of Lithuania (Documents) http://www3.lrs.lt/dokpaieska/forma_e.htm; IX-1007 Law on Income Tax of individuals,
http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_e?p_id=210886&p_query=&p_tr2=;
http://www.verslobanga.lt/lt/patark.full/3e172832c23ff
Additional information on the tax free minimum income amounts for the period 1994-2003 was extracted from the website http://www.tax.lt which provides various information regarding the Lithuanian tax system.

Netherlands

Wages
Wages are estimated based on changes in the OECD hourly manufacturing wage series for 1970-1978, 1980 and 1982. Intervening and subsequent years for the 1980s and 1990s appear to be in line with this same series. (OECD notes that this series was later dropped and estimated to be a fraction of the overall wage.) For all years after 1982, we use *Taxing Wages*. Post 2004 wages estimated from the APW based and change in OECD's AW series in Taxing Wages.

Social contributions in the Netherlands are convoluted, with shifting funds, and variation in employer/employee obligations over the years. In some years, some employer contributions are counted as taxable income. In some years, other contributions are formally made by the employee but employers are required to provide a compensating amount. Most notably, the mandatory system of health care insurance applies only to low income employees (often below the APW). However, higher income employees are required to get coverage. We applied the charge rate in the compulsory system to all wage-earners to account for the fact that they must pay for the insurance, even though they technically do not pay this charge to the public fund.

Unemployment
Sources: Benefits based on *SSPTW*, and consistent for overlapping years with those in MISSOC and OECD. Also see Minna van Gerven, 2008. "The Broad Tracks of Path Dependent Benefit Reform A Longitudinal Study of Social Benefit Reforms in Three European Countries, 1980–2006." *Studies in social security and health 100* Kela, Research Department | Helsinki *Notes*: Amounts are for the regular earning related Werkloosheidswet benefit, not assistance-based benefits. Gross benefit replacement rates were cut by 10-points in 1986.
Taxes: benefits are assumed to be fully taxable for income and social charges in all years.

Sickpay
Sources: Same as UE, except the 1985 level is listed as 75% in SSPTW.

Pension (minimum and standard)
Sources: For years back to 1976, amounts from Netherlands Ministry of Finance. SSPTW for prior years.
Notes: Pensions exclude the quasi-compulsory industry plans. Amount provided is flat rate and not income tested. Pension is subject to taxation and social charges for extraordinary medical insurance, survivors, and, until the late 1980s, family benefits. Applicable social charges are in income tax column (as they are based on the adjusted income). Pensioner special deductions from Ministry of Finance. Minimum pensions are the same as standard pensions.

Qualifying conditions
SSPTW, supplemented by MISSOC and OECD.
Unemployment: van Gerven (2008) details many changes to Dutch UI from the 1980s to the 2000s. Because benefits to the official assistance program (WWV) were not means-tested, we

include that program in the calculation of benefit duration. The 1987 reforms to unemployment insurance cut the basic benefit dramatically but provided more generous terms to those with a long employment record. Modest basic benefits (based on minimum wage) were payable on terms of the old system (26 weeks to qualify, payable for 26 weeks). Earnings-related "long-term" benefits were based on age and longer length of coverage (four years out of the last five). Given their age, CWED's notional worker (40-year-old) gets two years of benefits with the required length of coverage. Our "qualifying condition" represents the minimum insurance for earnings related benefits (i.e., 3-4 years since 1987), while duration is the insurance duration for a 40-year-old with 20 years of coverage. In fact, a person with only 4 years of insurance would receive just 6 months of earnings-related benefits under the new conditions. Update: from 2007 the duration of the earnings-related benefit is equivalent to 1 month per year of employment. A 40-year-old worker with 20 years of employment is entitled to 20 months of benefits. From 2016 a 40-year-old worker with 20 years employment is entitled to 1 month for each year for the first 10 years of employment and 0.5 months for each additional year thereafter, up to 24 months. In 2019 a 40-year-old worker with 20 years of employment is entitled to 10 months + (20 yr-10 yr) * 0.5 mo = 65 weeks. A 25-year-old worker with 2 years of employment is only entitled to the short-term benefits.

Coverage

Pensions: AoW recipients from Netherlands Central Bureau of Statistics (figures from 1998 are annual averages from the Statline Database). Joop Roebroek and Theo Berben's chapter in Flora's *Growth to Limits* note that public employees have a separate, but more generous, scheme, and that all employees are covered for sickness benefits, which were completely integration with industrial accident benefit system in 1967. Insured are assumed to be all labor force (and 15-64). Civil servants are integrated into the general scheme.

Sickness: labor force less self-employed. (Sickfund data likely includes non-employee adult members, and not clear whether they get sick pay in their private insurance.)

UE: no direct figures, but Ministry of Social Affairs reported (6/10/04) that non-covered (wage-earning) population has been "negligible" since the 1960s. We thus used Labor Force less self-employed minus the unemployed plus UI recipients over the labor force.

The sources in Flora's *State, Economy, and* Society for unemployment and sickness coverage are not clear. His two series are close to each other, but around 10 points less than these. In Roebroek and Berben's chapter in *Growth to Limits*, there are no coverage figures, only take-up rates. Their chapter notes that public employees are insured for unemployment in a separate scheme (generally with more generous replacement rates and conditions) (vol. 4, p. 687-88). While non-breadwinner females are not entitled under the UE Provision Act (which pays after 26 weeks up to 2 years from UE), they are entitled to the "standard" 6-month benefit under the Unemployment Insurance Act (WW). Qualifying information is based on the latter benefit (i.e., WW). UE takeup figures through 1982 from Flora vol 4 p. 732, then from yearbooks

Acknowledgements

Jeroen Fijen, Ministry of Finance. Information of AOW amounts, and various tax rates in even years back to 1976.

JWJ Siebers, Dept of Insurance and Organization of Implementation, CVZ (College voor zorgverzekeringen) AWBZ tax rates 1968-2003.

Ministry of Finance tables on tax deductions for seniors (1994-00)

Public Enquiry Office, Dutch Ministry of Social Affairs and Employment: information on coverage of WW (unemployment) insurance

New Zealand

Wages:
Prior to 1994, APW wages were based on normal wages plus overtime. Since then, what the wage has been based on is unclear.
The OECD *Taxing Wages* series for 1976 gives an APW for 1972-1976 based on male wages. The 1975 publication gives a much lower figure for 1974 APW, which is more in line with the hourly wage series, and seemingly more consistent with the Tax/Benefit publications in the 1980s and 1990s. Hence, we kept the 1974 figure and used the hourly wage growth series to estimate wages through 1978, and for 1980 and 1982. Taxes for this APW wage were estimated based on the tax structures given for 1976 and 1982, and those imputed for intervening years (NZ is not covered in the OECD tax descriptions for 1974). Wages for years preceding 1972 are based on the index of hourly mfg wage growth.
Post 2004 wages estimated from the APW based and change in OECD's AW series in Taxing Wages.

Unemployment, Sickness, and Pensions
Sources: From 1998 to 2012: Ministry of Social Development, Work and Income "Deskfile" (Sept 24, 2012), from 1981 (1977 for pensions) to 2003, Ministry of Social Development (MSD), mimeo on file. Pre-1981: *SSPTW*. Sickpay and Unemployment benefits diverge between 1981 and 1998. From 2013-2018 from Work & Income https://www.workandincome.govt.nz/products/benefit-rates/index.html
Taxes: Benefit figures from Ministry of Social Development are provided net of tax. All benefits covered in SSPTW (1979 and before) were not taxed. The MSD explained that UE benefits became taxable in *October 1979*, and all became taxable in *October 1986*.

Qualifying Conditions
From *SSPTW* and Ministry of Social Development Work and Income page https://www.workandincome.govt.nz/

Coverage
Pensions: pensions in force (NZ Superannuation) provided by Statistics New Zealand and recent Social Develop Ministry's Statistical Report. In generating pension generosity scores the previous version of the data we considered means-tested programs as having 50% coverage. In this version of the data we change the coverage rate of pensions to be 100% as there is evidence that citizens 65 and over are fully covered in this case.
UE and others: coverage is assumed to be 100%, some data exist to predict take-up, though recent figures include those counted as employed (part-time, low earnings) but also on benefit as jobseekers.
Note: while the entire labor force is considered covered, in calculating generosity scores for unemployment and sickness benefits we use a coverage rate of 0.5 to penalize the country score due to the means-tested nature of the programs.

Acknowledgements
Ron Mair, Statistics New Zealand: pensioners

Peter Hughes, Ministry of Social Development: benefit rates from 1981, and information on tax treatment over time.

Websites
Ministry of Social Development Deskfile: http://www.workandincome.govt.nz/manuals-and-procedures/deskfile/main_benefits_rates/unemployment_benefit_tables.htm
https://www.workandincome.govt.nz/products/benefit-rates/index.html
Ministry of Social Development. 2011. Statistical Report 2011

Norway

Wages

The wage data appear to come from the same sources used in the old SAF *Wages and Total Labour Costs for Workers* data. However, for 1982, 1980, and 1976-1978, the amounts differ. Since the sources for these years in the OECD database are not clear, and all available descriptions of the source cite the same data as SAF, we substituted the SAF data and calculation basis (daily wage*40*52), because the OECD series is inconsistent for so many other countries in these years. Tax rates were then estimated using the tax structure data available from the OECD *Taxing Wages* series (for years 1974, 1976, and 1982). Intervening years were imputed from summary tables or extrapolated from them.
Post 2004 wages estimated from the APW based and change in OECD's AW series in Taxing Wages.

Unemployment

Sources and Notes: For 1964-1980, based on data provided by the Norwegian Ministry of Labor and Government Administration (on file) for wages equal to the APW. Post-1980: *SSPTW*, OECD and MISSOC. After 1980, maximum benefit is 62.4% of 6*base amount, (then) plus supplements. Benefits were fully taxable only from 1/1/80.

Sickness

Sources and Notes: Through 1975, amount is equal to the unemployment benefit. Since then, several accounts (Norway's Social Ministry site, MISSOC, Palme's dissertation) suggest a 100% replacement rate. Flora, et al. (p. 82) note that gross replacement rate is not raised to 100% until June 1978 law and *SSSPTW* for 1979 states that the maximum benefit is limited to 90% of net income. We use the national data and use 100% from 1976. From 1979, there is provision for sick pay for staying home with sick children under 10. It is 10 days per year for each parent, double for single parents. This is paid by the employer.
Taxes: The benefit is fully taxable from July 1, 1978.

Minimum Pension

Sources: Minimum pension amounts provided in *Trygdestatistisk Arbok* 2002 and 2005.
Notes: Income-tested supplemental amounts are given in % of basic amount, and (apparently) do not exist before 1969. The minimum pension is assumed to be untaxed.
Update: the minimum pension was replaced by the Guarantee Pension in 2011 but the first cohort to which it applies is those born 1954 and after, so those retiring in 2019 at age 65 for the purposes of this project. The full guarantee pension is paid with 40 years of residence and no other income, otherwise it is reduced proportionally. A pensioner is entitled to the high rate if she/he is single or has a spouse/cohabitant with income under two times the basic amount and does not receive any other pension scheme. Otherwise, a married/cohabitating pensioner is entitled to the ordinary rate. (Source: https://www.nav.no/no/person/pensjon/nynorsk/garantipensjon_2#chapter-2)

Standard Pension

Notes and Sources: Standard pension amounts are a base amount plus a supplementary amount. The full supplement was 45% of average salary for each working year prior to 1993, and 42% for working years after. The pension payable is equal to the average of annual

pension points since 1967. Up to the first 20 years (i.e., through 1987), workers receive 5% of full pension for each year worked (i.e., they cannot receive the full 45% until 1987). From 1987, the full insurance period grows annually until reaching 40 years.
Note from SSPTW 2018: A new old-age pension system introduced in 2011 replaces the universal pension with a guaranteed minimum benefit and the earnings-related pension with an NDC pension. The new system covers persons born since 1963. Persons born before 1954 remain under the old system. A transitional (mixed) system, a combination of the old and new systems, covers persons born from 1954 through 1962.
Tax: The pension is taxable, but with a deduction for elderly people. Estimates for this deduction between 1979-2002 are based on endpoint data and adjustments of other deductions) for earlier years the deduction is equal to the basic amount. From 2007 the amount of the pension deduction comes from the Norwegian Tax Administration https://www.skatteetaten.no/en/rates/tax-allowance-for-pension-income/?year=2020#rateShowYear
In all years based on our calculations, there is no national tax owed (adjusted income is in the 0 bracket). Municipal tax is computed on the national taxable amount less the municipal, elderly and wage-earner deduction.

Coverage
Pensions: *Norwegian Statistical Yearbook*. Civil servants integrated into to general scheme
UE: Estimated from yearbooks and labor force data based on *SSPTW* descriptions. For 1950s, Flora, *State, Economy, and Society*. From 1971, government employees and fishermen included in insured, but excluded before. (This is consistent with Flora.) Recipient data refers to end of year for 1961-1992, then average for year.
Statistical Yearbook of Norway: https://www.ssb.no/en/befolkning/artikler-og-publikasjoner/statistical-yearbook (last edition was 2013)
Sickness: From 1971, entire labor force; prior to 1971, employees only (this is very close to Flora's results).

Qualifying Conditions
Unemployment: communication with Norwegian officials. After 1976, the unemployed can be eligible to receive UE benefits if his/her annual earnings are higher than 1.5 times (0.75 times before 2007) the base amount for full duration. We compute the qualifying period assuming the unemployed's annual earnings are equal to APW wages. Update: qualifying years and duration reestimated based on revised APW.
Pension: *SSPTW*, with details on how the transitional workers are treated in the employment pension scheme from Norweigan authorities
Sickness: *SSPTW*

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Mona Klausen, Dept of Labour Policy, Royal Ministry of Labour and Government Administration: Unemployment program benefits
Trine Eline Homble, Pension Division, Trygdeetaten, Rikstrygdeverket: Standard Pension benefit information
Øystein Haram, Dept. of Labour Policy: Information on taxation date of UE and sickness benefits.

Poland

Unemployment
Flat-rate benefit scheme. The amount is tied to the national economy wide average earnings. Duration is dependent on the unemployment rate in the region compared to the average unemployment rate of the country. The duration is 6 months in regions whose unemployment rate does not exceed 125% of the national average unemployment rate, and 12 months in regions exceeding this figure (high unemployment regions). For the calculations in the dataset it is assumed that the beneficiary lives in a high unemployment region and is thus eligible to 12 months of benefit payments.
Taxed as regular income. According to OECD, unemployment benefits are liable to Health Insurance contributions only since 2007.

Sickness insurance
Earnings-related scheme.
Fully taxable. As regular income, sickness benefits are liable to Health Insurance Contributions since 1999.

Minimum pensions
Covered by the general social assistance scheme (*pomoc spoleczna*). The benefit paid is called Permanent Allowance (*zasilek staly)*. The permanent allowance is a social assistance benefit targeted at people unable to work due to disability or age and who are not entitled to a social insurance pension.
Not liable to taxation and social security contributions.

Coverage
Sickness insurance coverage: Number of working age contributors to a sickness benefit scheme (ILO SSI)
Unemployment insurance coverage: Number of people covered by unemployment insurance. Data kindly provided by Anna Siporska from the International Co-operation Department of the National Social Insurance Institution (ZUS, Zakład Ubezpieczeń Społecznych; Email November 29, 2011).

National sources and acknowledgements
National legislation.
We would like to thank Magdalena Kolega from the Department of Family Policy of the Polish Ministry of Labour and Social Policy for providing us with extensive information regarding the system of family benefits.
Information on flat-rate unemployment benefit amounts was extracted directly from national legislative documents.

Portugal

The information and codebook was prepared by Ben Danforth.

Wages

The Average Production Wage (APW) has been taken from OECD series on wages and taxes, appearing under various names. For the sake of completeness and continuity, a missing value for this series has been estimated (highlighted in yellow in supplemental data). Moreover, with the OECD's shift from APW to AW (average wage) in 2005, it has been necessary to estimate APW for the years 2006 and onward. The AW series (taken from stats.oecd.org) was used as a reference series in this estimation process.

Wages and benefits are generally quoted in monthly terms. To get annual figures, one usually multiplies the monthly figures by 14, which incorporates standard bonuses paid in July and in December. Note that the 14-payment system only became widely institutionalized after the revolution in April 1974, so this is used as the change point from 12 to 14 payments. It would be a number of years, however, before these two bonus payments would be considered insurable income for social insurance. For the purposes of calculating days of contributions to social funds, monthly salaries are deemed equivalent to 30 days of contribution (regardless of the actual number of days in a given month). There are, on average, 4.35 weeks in month. For calculating the duration of benefits, the 7-day week is usually the standard.

There is a minimum wage in Portugal, which has been used in the calculation of some deductions and benefits. Historically, the minimum wage has varied across 3 different categories of workers—domestic help, agricultural workers, and other professions. In this data set, the minimum wage for other professions is used as the reference series. Beginning in 2007, however, a new indicator, IAS (*Indexante dos Apoios Sociais*) has been used as an index for this purpose.

Note that the S67 wage calculations in this data set differ slightly from those found in OECD calculations. The S67 wages are calculated as APW*0.67 in this data set while they are calculated as APW*2/3 in the OECD tables.

Post 2007 wages estimated from the APW based and change in OECD's AW series in Taxing Wages.

Taxes

Tax Year: January 1 – December 31

The income tax system for wage earners initially included two different types of taxes, a professional tax (*imposto professional*) and a complementary tax (*imposto complementar*). The former was applied to earned income prior to deductions while the latter was applied to global income after deductions (the professional tax itself became a deduction). In a two-earner household, the professional tax applied to each earner's income separately while the complementary tax applied to the global household income.

In the case of the professional tax, the tax rate corresponding to a given income level is applied to the entire income. The complementary tax, on the other hand, has a cumulative structure, with a higher tax rate applied to each successive block of income.

Portugal eventually replaced the professional and complementary taxes with a modern income tax (*Imposto Sobre o Rendimento das Pessoas Singulares, IRS*), which came into effect starting in 1989. The family/household remained to be the tax unit.

With regard to the taxation of social benefits, all major entitlements (unemployment, sick pay, and pensions) were exempt from the professional tax. All of the entitlements minus pensions were also exempt from the complementary tax and the income tax (IRS) that later replaced the aforementioned two taxes.

The tax information provided by the OECD is spotty for earlier years, particularly the 1970s. To fill in gaps and verify information, some of the original legislation has been examined. Here is a list of relevant legislation by type of tax and tax year.

Professional Tax

1970 – Decreto-Lei n.º 49483 (1969)
1971 – Decreto-Lei n.º 49483 (1969)
1972 – Decreto-Lei n.º 49483 (1969)
1973 – Decreto-Lei n.º 49483 (1969)
1974 – Decreto-Lei n.º 718/73, superseded by Decreto-Lei n.º 375/74
1975 – Decreto-Lei n.º 375/74
1976 – Decreto-Lei n.º 375/74
1977 – Decreto-Lei n.º 667/76
1978 – Decreto-Lei n.º 138/78
1979 – Decreto-Lei n.º 138/78
1980 – Decreto-Lei n.º 183-D/80
1981 – Decreto-Lei n.º 132/81
1982 – Decreto-Lei n.º 198/82
1983 – Decreto-Lei n.º 119-I/83
1984 – Decreto-Lei n.º 180/84
1985 – Decreto-Lei n.º 90/85
1986 – Decreto-Lei n.º 116/86
1987 – Decreto-Lei n.º 127/87
1988 – Decreto-Lei n.º 98/88

Note that the income exemption was not always included in the tax tables and changed less frequently.

Complementary Tax

For each year from 1979-1988, two tables were provided—one for individuals and one for couples. The tables appeared together.

Base Legislation

1962 – Decreto-Lei n.º 44305
1963 – Decreto-Lei n.º 45399
1970 – Decreto-Lei n.º 49483 (1969)
1971 – Decreto-Lei n.º 49483 (1969)
1972 – Decreto-Lei n.º 49483 (1969)
1973 – Decreto-Lei n.º 375/74
1974 – Decreto-Lei n.º 375/74
1975 – Decreto-Lei n.º 667/76
1976 – Decreto-Lei n.º 667/76
1977 – Decreto-Lei n.º 667/76
1978 – Decreto-Lei n.º 667/76
1979 – Decreto-Lei n.º 183-F/80
1980 – Decreto-Lei n.º 136/81
1981 – Decreto-Lei n.º 196/82
1982 – Decreto-Lei n.º 119-J/83
1983 – Decreto-Lei n.º 42/83, superseded by Decreto-Lei n.º 192/84

1984 – Decreto-Lei n.º 192/84, superseded by Decreto-Lei n.º 115-D/85
1985 – Decreto-Lei n.º 112/86
1986 – Decreto-Lei n.º 135/87
1987 – Decreto-Lei n.º 135/87
1988 – Decreto-Lei n.º 66/89

In the tax tables for the new personal income tax (IRS), the deduction for each bracket (k) can be ignored. One can either calculate the tax liability by multiplying the taxable income by the top marginal rate and subtracting the corresponding value for k or by using the conventional method of computing a cumulative base tax for a given bracket and adding the marginal tax for income falling in that bracket.

Also note that a "minimum existence" rule was instituted when the IRS was implemented. According to this rule, disposable income (gross income – income taxes) could not fall below the minimum wage. Beginning in the 1999 tax year, this floor was raised to 120% of the minimum wage. At the same time, an additional rule established that no tax would be levied on couples whose conjugal quotient (usually taxable income/2) fell below a set amount (initially 300,000$, see Lei n.º 87-B/99).

Allowances/Credits

The OECD series on wages and taxes and Portugal's tax legislation were the main sources used in assembling these data. The allowances and credits used in the Portuguese tax system have generally been straightforward, with a few exceptions.

From 1970-88, there were only tax allowances, and they were applied solely in the calculation of the complementary tax. Given that the child allowances varied in relation to the age of each dependent child, it is assumed that the two children in the family models are around age 10. Note that, during these years, pensioners as well as workers could claim earned income allowance.

From 1989 onward, with the new income tax in place, pensioners received their own allowance. With the creation of this generous allowance, pensioners could no longer claim the earned income allowance, though this has changed in 2012 (the two allowances have been merged). Under the reformed tax system, family credits replaced the family allowances. Here are a few additional notes:

1996 – The amount of the child credit started to vary in relation to the number of dependent children in the household (see Lei n.º 30-C/2000, took effect on January 1, 1996)

2001 – The tax credits for household members were set as a percentage of the minimum wage (60% of monthly minimum wage for a single taxpayer, 50% for each married taxpayer, and 40% for each dependent child) (see Lei n.º 30-C/2000, took effect on January 1, 2001)

2007 – The tax credit for single and married taxpayers was harmonized, set at 55% of the monthly minimum wage for each qualifying individual. The child tax credit was also doubled for all dependent children under the age of 3 (see Lei n.º 10-B/1996, took effect on January 1, 2007).

Social Security Contribution Rates

1963 – As part of an effort to reform and standardize the social insurance system, a single contribution rate was established for the system. The initial rate was set at 5.5% for employees and 15.0% for employers (8% of this 15% went to insurance programs and 7% went to family benefits) (see Decreto n.º 45266 [1963]).

1966 – A maximum base for social security contributions was established—10,000$00 per month (see Portaria n.º 21799 [1966]).

1970 – The contribution rate was increased for both employees and employers (1% and 2%, respectively) to cover survivor benefits.
1972 – The maximum base for social security contributions was raised to 15,000$00 per month (see Portaria n.º 444/71, took effect on February 1, 1972).
1973 – The maximum base for social security contributions was raised to 20,000$00 per month. The maximum was abolished for successive years (see Portaria n.º 444/71, took effect on January 1, 1973)..
1975 – As part of the 1974 constitution, an unemployment insurance program was created. The program went into effect on April 1, 1975. A law passed in 1975 set the contribution rate for the unemployment fund at 3% (same rate for both employees and employers), and the levy went into effect on April 1, 1975 as well (see Decreto-Lei n.º 169-C/75).
1977 – The contribution rate for social insurance (everything excluding unemployment insurance) was increased to 7.5% for employees and 19% for employers (see Decreto-Lei n.º 29/77, took effect January 1, 1977).
1980 – The contribution rate for social insurance (everything excluding unemployment insurance) was increased to 8% for employees and 20.5% for employers (see Decreto-Lei n.º 513-M/79, took effect January 1, 1980).
1983 – The contribution rate for unemployment insurance was increased to 3.5% for employees and 4% for employers (see Decreto-Lei n.º 239/83, took effect on June 1, 1983).
1986 – As part of a reorganization of the social insurance system, a single contribution rate was established and set at 11% for employees and 24.50% (includes 0.5% to cover employment-related illness) for employers (see Decreto-Lei n.º 140-D/86, took effect on October 1, 1986).
1995 – The contribution rate for employers was reduced to 23.75% (includes 0.5% to cover employment-related illness) (see Decreto-Lei n.º 239/83, took effect on June 1, 1983).
As note above, the unemployment insurance program came into effect on April 1, 1975. Collection of contributions for the unemployment fund also started at this time through employee and employer levies distinct from the main social contributions. On October 1, 1986, however, single employee and employer levies covering all social insurance programs in existence at the time were instituted. The combined contributions from employees and employers were then divided among the various insurance funds (the Portion from Total column shows the allocation to the unemployment fund, e.g. 3.5 percentage points of the 35.5 employee/employer total in 1987).
1975 – Decreto-Lei n.º 169-D/75
1976 – Decreto-Lei n.º 169-D/75
1977 – Decreto-Lei n.º 183/77
1978 – 1979 – Decreto-Lei n.º 128/78
1980 – 1983 – Decreto-Lei n.º 445/79 (came into effect October 1, 1979)
1983 – 1986 – Decreto-Lei n.º 297/83 (came into effect June 1, 1983)

Cash Transfers

1970 – All families with dependent children, regardless of their incomes, received monthly cash transfers. The amount of each transfer was based on the number of dependent children. Beginning in 1969, the transfer was set at 100$00 per month per child (see Decreto n.º 49216 [1969], took effect on September 1, 1969). This amount was periodically raised in later years.
1973 – For this year, the transfer amount varied by the number of dependent children. The transfer was 160$00 per month for the first child and 200$00 per month for the second child.

For each child beyond the second, the transfer was 240$00 per month (see Decreto-Lei n.º 328/73, took effect on June 1, 1973).
1974 – Following the Carnation Revolution, the child transfer returned to a uniform amount per child and increased—240$00 per month per child (see Decreto-Lei n.º 217/74, took effect on May 27, 1974).
1980 – During this year, the transfer amount was again set to vary by the number of dependent children. The transfer was 160$00 per month for the first child and 200$00 per month for the second child. For each child beyond the second, the transfer was 240$00 per month (see Decreto Regulamentar n.º 20/80, took effect on June 1, 1980).
1991 – A new system was introduced that made cash transfers for dependent children a means-tested benefit. In order to qualify for this benefit, a family had to fall below a set income threshold. Initially, this threshold was set at 1,000,000 pesetas for one dependent child, with a 15% increase (i.e 150,000) for each additional child. A family with an income slightly exceeding the relevant threshold was still entitled to a benefit, but at a reduced amount. Under these circumstances, the benefit amount was calculated using the following formula: (1,000,000+0.15*1,000,000*(n-1)+3,600*n) – gross income, where n is the number of dependent children. If the amount computed with this formula divided by the number of children was less than 3,000, then no benefit was paid (considered too insignificant) (see Ley 26/1990).
1995 – Beginning with this year, the income threshold started to increase every year (see Ley 1/1994). These increases usually appeared in legislation that revalued public pensions.
2000 – The amount of the cash transfer per dependent child was increased from 36,000 to 48,240 pts (291 euros). The benefit paid out in the prior year, 1999, was also retroactively increased to 47,460—the difference between this amount and 36,000 was ultimately paid out as a lump sum. The minimum amount for the payout of the cash transfer was increased from 3,000 to 4,025 pts (24,25 euros).
Note that in 2003, a 13th payment was introduced to cover school expenses in poor families (those in income bracket 1) (see Decreto-Lei n.º 176/2003). The OECD publications mistakenly extend this extra payment to all income brackets. For 2009, the extra payment was extended to all income brackets (see Decreto-Lei n.º 245/2008 and Decreto-Lei n.º 77/2010).

Unemployment Insurance

1975 – Unemployment insurance was not added to the social security system until 1975. At this time, it took the form of a flat-rate benefit—1/2 of the minimum wage for people with no dependents and 2/3 of the minimum wage for people with dependents. The benefit lasted 26 weeks (180 days), though extensions were possible for older workers. The benefit was not paid during the first 30 days of unemployment (see Decreto-Lei n.º 169-D/75 took effect on April 1, 1975).
1976 – The standard duration was increased to 52 weeks (360 days) (see Decreto-Lei n.º 761/75, took effect on January 1, 1976).
1977 – The standard duration was changed back to 26 weeks, with the age-related extensions remaining in place. The Ministries of Labor and Social Affairs were, however, given more discretion in granting extensions under other circumstances (see Decreto-Lei n.º 635/76, took effect on May 1, 1976).
1978 – The benefit rate was increased to 60% of the minimum wage for those with no dependents and 75% of the minimum wage for those with dependents. The waiting period was reduced from 30 to 7 days (see Decreto-Lei n.º 183/77, took effect on June 4, 1977). The benefit rate was then set as fixed amounts—3200$ for people with no dependents and 4200$ for people with dependents (see Decreto-Lei n.º 128/78, took effect on April 1, 1978).

1980 – The benefit rate was revised again, returning to percentages—70% of the minimum wage for no dependents, 80% for 1-2 dependents, 90% for 3-5 dependents, and 100% for 6+ dependents (see Decreto-Lei n.º 445/79, took effect on October 1, 1979). Revision to CWED2: recalculated benefit rates to 80% for couples with children, 90% for one-earner household with children and dependent spouse.
1984 – The benefit duration was reduced to 450 days (65 weeks), and the qualifying condition was revised such that the 6 months of contributions could be recorded at any time in the 360 days prior to unemployment (see Decreto-Lei n.º 297/83, took effect on July 1, 1983).
1985 – The unemployment insurance system was substantially reformed, with the revised system having separate contributory and non-contributory programs. The benefit rate for the contributory insurance was made equivalent to that for sick pay, with minimum set at the minimum wage and the maximum at three times the minimum wage. To qualify for the contributory benefit, a worker needed at least 36 months (156 weeks) of registered contributions. The duration of the contributory benefit was set. The duration of the benefit was set at 6 months, with 1 additional month of benefit for every 12 additional months of contributions (23 months total if assume 20 years of contributions). Lastly, the waiting days previously in effect were eliminated (see Decreto-Lei n.º 20/85, took effect on February 1, 1985). Revision to CWED2: recalculated minimum benefit as the minimum wage, except for S50, which is below the minimum wage and so benefits are calculated as benefit rate*gross wage (see Decreto-Lei n.º 20/85, took effect on February 1, 1985, article 6).
1990 – The benefit rate was decoupled from the sick pay rate and set at 65%. The qualifying period was reduced to 540 days, with these days recorded in the 24 months prior to unemployment. The duration of the benefit was made conditional on the age of the worker, ranging from 10 months of benefit for those aged 24 and younger to 30 months for those aged 55 and older (21 months for 40-year-old worker) (see Decreto-Lei n.º 79-A/89, took effect on May 28, 1989) In follow-up legislation, the income base for benefit calculations was extended to include the July and December payments (see Portaria n.º 994/89, retroactively took effect on May 28, 1989).
2000 – The benefit duration was increased for lower age groups, shifting the range to 12-30 months. For a 40-year –old worker, the duration increased to 24 months (note that SSPTW misreports the age groups found in the actual legislation) (see Decreto Lei n.º 119/99, took effect on July 1, 1999).
2007 – The contribution period was decreased from 540 to 450 days (65 weeks). The benefit duration also became partly conditioned on the length of the contribution history, with 5 years of contribution (60 months) necessary for a 40-year-old worker to receive the full 720 days of unemployment benefit (52 weeks). At the same time, an additional 30 days of benefit was granted for each 5-year contribution made in the preceding 20 years (see Decreto-Lei n.º 220/2006, took effect on January 1, 2007).

2010 – The contribution period was temporarily decreased from 450 to 365 days for this year (see Decreto-Lei n.º 324/2009).
Minimum Payment: From 1990-2018 the minimum payment is equal to the reference wage if the reference wage is less than the minimum wage (Decreto-Lei n.º 79-A/89).
2013-2017 – the benefit formula varies with a higher rate for the first six months of unemployment and a lower rate for the remaining duration. This does not affect our calculations, which are based on the first six months of unemployment
Single parent and single earner households with dependent children: increase rate if head of household with dependent children

2018 – the benefit formula reverts to a single rate for the duration of the unemployment spell
Source of Legislation: https://dre.pt/
Tax & SSC: Benefit is not taxed if below 80% of previous earnings, single-parent households do not pay social contributions. The replacement rate is up to 100% of net wage if gross benefit is greater than net wage.
CWEP update: OECD Tax/Ben documents a temporary reduction in the qualifying period between 2004-2006 (270 days from 540 days), then it is raised to 450 days in 2007-2011, and then reduced to 360 days from 2012-2019.

Sick Pay
1970 – The sick pay available in 1970 was established in two pieces of legislation from the 1960s (see Lei n.º 2115 [1962] and Decreto n.º 45266 [1963]). The benefit rate was set at 60% for the first year of illness and 30% for the next 3 years (209 weeks total). To qualify for the benefit, one needed to have at least 12 months of contribution on record, with at least 8 days in 3 months prior to the illness. There was a 3-day waiting period before the benefit would be paid out. If the four years of sick pay were exhausted, the benefit was converted into the permanent disability benefit.
1973 – The qualifying period was reduced from 52 weeks to 26 weeks (6 months). It remained a condition that 8 days of contributions were on record for the prior 3 months (see Decreto n.º 25/73, took effect on January 19, 1973).
1974 – The replacement rate was revised, making 60% the standard rate for all 4 years for which the benefit could be claimed. Holiday bonuses were excluded from the covered income (see Decreto n.º 358/73, took effect on July 1, 1973).
1978 – The duration of sick pay was decreased to 1095 days (156 weeks) (see Decreto Regulamentar n.º 25/77, took effect on April 18, 1977).
1988 – The replacement rate was changed to 65% for the entire duration of sick pay. The index of professionalism, a qualification condition, became 15 days of contribution in the 3rd and 4th months prior to the onset of illness (see Decreto Regulamentar n.º 36/87, took effect on July 1, 1987).
1989 – The replacement rate was revised, with the end result being 65% for the first year of illness and 70% for the remaining time beyond one year. Although they continued to be excluded from the base income for benefit calculations, holiday bonuses started to be replaced during sick leave at a rate of 60%. A minimum benefit was established, equivalent to 30% of the minimum wage or the wage basis, whichever was lower. The index of professionalism was also modified such that 12 days of contribution in the four months preceding the month of the illness became the required amount to qualify for sick pay (see Decreto-Lei n.º 132/88, took effect on May 1, 1988).
2004 – The benefit rate was changed to 55% for days 0-30, 60% for days 31-90, 70% for days 91-365, 75% for days 366 and beyond for a spell of temporary illness. 5% was added to the first two levels (55% and 60%) in cases where the recipient supported a need family (reference wage less than 500 euros a month, 3 or more dependent children, or a disabled dependent). The index of professionalism was again altered, with 20 days of contributions in the four months preceding the month of illness becoming the new requirement (see Decree-Law n. º 28/2004, took effect on April 1, 2004).
2005 – On January 1, 2005, a benefit ceiling came into effect—the sickness benefit could not exceed the earnings being replaced on a net basis, defined as gross income minus social security and personal income taxes (see Decreto-Lei n. º 28/2004, this particular clause came into effect later than the rest of the law).

2006 – The benefit rate for the first 90 days was set at 65%. The number of qualification days in the four months preceding the month of illness was changed back to 12 (see Decreto-Lei n.º 146/2005, took effect on September 1, 2005).
Revision of CWED2: Beginning in 2005 the benefit rate was changed to reflect the different rates for different periods of illness according to the rules described above.
Note that sick pay is not subject to taxation (neither social security contributions nor personal income taxes).

Standard Pension

In calculating the pension benefits, it is assumed that a worker retires at the beginning of a given year. This means that the last year of earnings is the year prior to the year of retirement.
1970 – The pension system in place at this time was initially proposed in 1962 and 1965 (see Lei n.º 2115 [1962] and Decreto n.º 46548 [1965]) and put into effect in 1966 (see Portaria n.º 21799 [1966], took effect on February 1, 1966). This system replaced one that had been established in 1933, with the main aim being increased coverage. The benefit rate was set at 2% per year of contribution, with a maximum of 80% for 40 years of contributions. There was a minimum benefit, set at a flat amount (raised to 600$ per month on January 1, 1970, see Portaria n.º 24477). The base wage for calculating the benefit was simply the average wage for all years of contributions, with no adjustments for inflation. If this base wage was less than 60% of the average for the 10 years of highest earnings, then it was raised 10%—but an adjusted base could not exceed this reference amount from the highest earning years. To qualify for a pension, 10 years of insurance was required, with 60 of continuous contributions included in this period.
1974 – Changes were made to the way in which the base wage was calculated, with reference period narrowed to the prior 10 years of insurance. In particular, the base wage was the highest five years of earnings in this 10-year period. These changes were made to simplify administration and increase benefits. The maximum rate was also reduced to 70% and a minimum rate of 30% was introduced (note that a flat minimum amount remained in effect). And, for the first time, 20% was added to the benefit rate if a recipient had a dependent spouse (any income accruing to the spouse could reduce or negate this bonus). Finally, the qualifying period was reduced to 3 years, with 24 months of continuous contributions included in this period (see Decreto n.º 486/73, took effect on January 1, 1974). At the end of 1974, a 13^{th} monthly payment for old-age pensions was created to serve as a Christmas bonus (see Decreto-Lei n.º 217/74, took effect on December 12, 1974).
This section is incomplete. Further changes were made in 1978 (Decreto Regulamentar n.º 24/78), 1983, and 1994, among other things. For a time, it seems that the maximum pension amount was linked to the salary of a minister in government (Decreto-Lei n.º 410/74).
Update:
2001 Pension reform (Decree-Law 35/2002) determined that the pension calculation would be based on the entire career, up to 40 years. However, there was a transition period and people retiring up to 2016 remained under the old rules (best 10 of last 15 years' wages). From 2017 the pension amount would be calculated according to the proportion of years of contributions before/since 2002. So that a person retiring in 2017 had 58% of their contribution history up to 2001 and 42% since 2002, and the final pension amount is equal to 58% of the 10-yr method plus 42% of the lifetime method.
The 13th payment was introduced in 1974 and the 14^{th} payment was introduced in 1990.
Decreto-Lei n.º 329/93 established the minimum pension rate of 30% of the average wage and a maximum of 80% of the average wage.
Decreto-Lei n.º 160/80 established the old age social pension, means-tested.

The final pension amounts reflect updated minimum pension rates.
Up to 1997 a pensioner with a dependent spouse received a supplement.
Pensions are taxable in principle, but after allowances the amounts are below the first tax threshold and so are exempt from taxation in practice for the household types examined here.
Dependent spouse supplement was discontinued in 1997, we use the social pension thereafter for the C1000 household.
Sources:
Pensions at a Glance 2019: Country Profiles-Portugal
Old Age Pension Practical Guide 2020, Social Security Institute (http://www.seg-social.pt/documents/10152/14521673/7001_pensao_velhice.pdf/003416f8-5c4e-44e6-a502-844a423a9396)
OECD Reviews of Pension Systems: Portugal 2019 (https://www.oecd-ilibrary.org/social-issues-migration-health/oecd-reviews-of-pension-systems-portugal_9789264313736-en)

Minimum Pension

A guaranteed, non-contributory pension (*pensão social*) was first introduced on a limited basis in 1974 as part of Portugal's transition back to democracy (see Decreto-Lei n.º 217/74). The non-contributory pension was initially restricted to those already receiving some sort of social assistance, but this restriction was removed in 1978 (see Despacho Normativo n.º 59/77). Prior to the introduction of this social pension, those of retirement age not meeting the conditions for a contributory pension had to rely on a fragmented system of social assistance. For the purposes of this data set, there was no universal right to a social pension at age 65 until 1978.
Note that the annual revisions of the benefit amount for the social pension usually took effect on December 1. As a consequence the payment for December and the holiday payment for this month would generally be higher than the prior payments for the year (one exception is 1982, see Decreto Regulamentar n.º 92/82).
1978 – The eligibility conditions for a non-contributory pension were initially set at: aged 65 and over, not be gainfully employed, not be covered by any social security scheme, have a monthly income less than 1200$ per month. For married individuals, household income was also required to be less than 50% of the minimum wage. The benefit remained at the levels set in 1974—1000$ for urban residents and 500$ for rural residents (this data set uses the urban figure) (see Despacho Normativo n.º 59/77, took effect on January 1, 1978).
1980 – The income limits were revised, with the new limits set at 30% of the minimum wage for single people and 50% of the minimum wage for married people. The number of payments for each year was also increased from 12 to 13 to include a payment for the December holiday (see Decreto-Lei n.º 464/80. took effect on November 1, 1980).
1990 – The number of payments for each year was increased from 13 to 14 to include a payment for the July holiday (see Portaria n.º 470/90, took effect on July 1, 1990).
2001 – An extraordinary supplement (*complemento extraordinário de solidariedade)* was created for social pensioners, with one a lower amount for those under age 70 and a greater amount for those aged 70 and over (see Decreto-Lei n.º 208/2001, took effect on July 1, 2001).
2009 – Another solidarity supplement for the elderly (*complemento solidário para pessoas idosas) was extended to those aged 65 and over. First instituted in 2006, the supplement was gradually extended from the oldest old (aged 80 and over) in the first year to younger cohorts in subsequent years. The supplement is calculated as the difference between a person's gross income and a reference amount, with separate reference amounts for single and married*

people. The supplement essentially establishes a minimum income for all people aged 65 and over (see Decreto-Lei n.º 232/2005)..
2011 – The income limits for social pensions were revised, with new limits set at 40% of the IAS for single people and 60% of the IAS for married people (see Lei n.º 3-B/2010, took effect on April 28, 2010).
Note that social pensions are not subject to taxation (neither social security contributions nor personal income taxes). Minimum pension values are from MISSOC from 2004 and refer to the values corresponding to Minimum Resources Guaranteed for those 65 years and older and include a solidarity supplement.
Social Pension Practical Guide 2020, Social Security Institute: http://www.seg-social.pt/documents/10152/24730/pensao_social_velhice/826caa65-09bb-465a-8dd3-9c22d97ee924

Coverage
Updated:
Pensions: Pensões: Velhice from PORDATA: https://www.pordata.pt/Portugal/Pens%C3%B5es+da+Seguran%C3%A7a+Social+total++de+sobreviv%C3%AAncia++de+invalidez+e+de+velhice-96
UE/Sickness: Active contributors to social security (Beneficiários activos da Segurança Social: Quantos trabalhadores contribuem para a Segurança Social?) from PORDATA:https://www.pordata.pt/Portugal/Benefici%c3%a1rios+activos+da+Seguran%c3%a7a+Social-379

Romania

Unemployment

Until 2007 benefits were proportional to former gross earnings. The percentage paid was based on the length of the social insurance record. Since 2007, benefit payment consists of two components: a certain percentage of the gross legal minimum wage and a certain percentage of former gross reference earnings. The actual percentage figures are dependent on the length of the social insurance record.

Not liable to income taxes. Benefits are not subject to social security contributions.

Sickness insurance

MISSOC reports a minimum of one month of contributions as qualification requirement from 2007 on, whereas ISSA continues to report 6 months. We code the qualification period according to MISSOC.

Benefits are not subject to taxation. Social contributions for invalidity, old-age and survivors are due from the sickness benefit. A ceiling applies (5 times the national average wage), but this is way above our gross benefit and therefore not reflected in our calculations. The information on the amount of these contributions is sketchy and so we refer to the rates given in MISSCEO and MISSOC. In 2000, MISSCEO reports no employee contributions, so that we apply a rate of 0. This is also assumed to be the case prior to 2000. The social security contributions thus are a rough estimation.

Minimum pensions

Covered by the general social assistance scheme. From 1995 onwards based on the law on social assistance (Law 67/1995). In 2001 a Guaranteed Minimum Income scheme (*venit minim garantat*) was legislated, with benefit rates adjusted annually by the government. The Guaranteed Minimum Income took effect in January 2002. The benefit rate is obtained by subtracting the net income of the household (assumed to be 0) from the Guaranteed Minimum Income.

Benefits are not subject to taxation and social security contributions.

Coverage (n.a.)

National sources and acknowledgements

The benefit rates for minimum pensions were extracted from national legislation. We would like to thank Dr. Cristina Rat ("Babes-Bolyai" University Cluj Napoca) for her kind help with the data and documents as well as Konstantin Baltz for assistance with translations.

Slovak Republic

Unemployment
Earnings-related scheme.
Not subject to taxation. No social security contributions.

Sickness insurance
Earnings-related scheme.
Not subject to taxation. No social security contributions.

Minimum pensions
Covered by the general social assistance scheme. From 1998 until 2003: “Benefit in need for objective reasons”. From 2004 onwards an additional Protecting Allowance is paid.
Not liable to taxation and social security contributions.

Coverage
Data on the number of insured persons was kindly provided by Dr. Marian Škotka from the Slovak Social Insurance Agency (Department of Communication, Email Oktober 11, 2011).

National sources and acknowledgements
Additional information on maximum daily benefit amounts and method of calculation for sickness insurance benefits was kindly provided by Katarinia Karvasova from the Slovak Social Insurance Agency (Department of EU Affairs and Foreign Relations).

Slovenia

Unemployment
Earnings-related benefit scheme.
Fully taxable. Liable to a social contribution which covers health services and other contingencies.

Sickness insurance
The sickness benefit is paid by the employer for the first 30 days of absence. There is some contradictory information on the amount of the wage continuation in the first 30 days; according to some years in MISSCEO (2002) and MISSOC (2004) the rate is 100%, yet other years and ISSA document the same rate as for the actual sickness benefit after the first 30 days (90%). We therefore code continuously 90%.
OTHER: Since we do not have information on the level of child benefits from 1995-1999 and 2003, the values were estimated on the basis of the average percentage of the child benefit on the APWW (the amount of the child benefit is dependent on the relation of the family income per family member to the National Average Wage).
In 2005, new taxation rules came into force which increased the personal and family tax allowances by nearly 50 %. For one year (2005) this resulted in the taxable income (benefit) for our family case to be reduced to zero and the tax rate for the APWW also being extremely low (0,2 percentage). Consequently, the family replacement rate dipped down by 27 percentage points. It is important to notice, that this dip is only due to the tax rules while the benefit rules remain the same.

Minimum pensions
Until 1999 persons not eligible to a regular social insurance old-age pension were covered by the general social assistance scheme. In 2000 a residence-based social pension was introduced, targeted to people not entitled to a social insurance old-age pension.
Not liable to taxation and social security contributions.

Coverage
Unemployment insurance coverage: Number of working age contributors to an unemployment benefit scheme (ILO SSI). Civilian labor force (OECD) instead of total labor force.
Sickness insurance coverage: The compulsory health insurance (managed by the Health Insurance Institute of Slovenia) covers the whole population with permanent residence in Slovenia which is covered under the unique compulsory insurance scheme either as mandatory member or as their (family) dependants. Virtually the entire population is insured and coverage is therefore coded with 100 % (Health Insurance Institution of Slovenia. 2007. *Compulsory Health Insurance in Slovenia. Today for tomorrow*.
http://www.zzzs.si/zzzs/internet/zzzseng.nsf/8ea0ac183a9edc58c1256e6f003454a8/c7012dc1562b7ae0c1256e890047583f/$FILE/Compulsory%20Health%20Insurance%20in%20Slovenia_December%202007.pdf).

National sources and acknowledgements
Data for minimum pensions was kindly provided by Brane Kokot from the Institute of Pension and Invadility Insurance of Slovenia (*Zavod za pokojninsko in invalidsko zavarovanje Slovenij*). Data on file.

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Additional information regarding the reform of income taxes in the period 2005/2006 was kindly provided by Alenka Kovač-Arh from the Slovenian Ministry of Finance.

Spain

The information and codebook was prepared by Ben Danforth.

Wages

The Average Production Wage (APW) has been taken from the OECD series on wages and taxes, appearing under various names. For the sake of completeness and continuity, a few of the missing values for this series have been estimated (highlighted in yellow in supplemental data). Moreover, with the OECD's shift from APW to AW (average wage) in 2005, it has been necessary to estimate APW for the years 2006 and afterward. The AW series (taken from stats.oecd.org) was used as a reference series in this estimation process.

Wages and benefits are generally quoted in monthly terms. To get annual figures, one usually multiplies the monthly figures by 14, which incorporates standard bonuses paid in July and in December. For the purposes of calculating days of contributions to social funds, monthly salaries are deemed equivalent to 30 days of contribution (regardless of the actual number of days in a given month). There are, on average, 4.35 weeks in month.

There is a minimum wage in Spain, which has been used in the calculation of social contributions and benefits. Beginning in 2004, however, a new indicator, IPREM (*Indicador Público de Renta de Efectos Múltiples*) has been used as an index for these purposes.

Note that the S67 wage calculations in this data set differ slightly from those found in OECD calculations. The S67 wages are calculated as APW*0.67 in this data set while they are calculated as APW*2/3 in the OECD tables.

Post 2004 wages estimated from the APW based and change in OECD's AW series in Taxing Wages.

Taxes

Tax Year: January 1 – December 31

Prior to 1979, Spain had two different types of taxes that applied to earned income: the first was levied on an individual basis while the second was levied on a family/household basis. The former was basically a flat tax on earned income (*Impuesto sobre los Rendimientos del Trabajo Personal*) while the second was a progressive tax on total income (*Impuesto General sobre la Renta de las Personas Físicas*).

1968 – Tax on earned income: the flat rate was 14%, though manual workers (employees) and army personnel were taxed less as they were gradually being incorporated into the system (3% in 1968, 6% in 1969, 9% in 1970 and 1971, and full 14% from 1972 onward—dates later pushed forward to 1969, 1970, 1971 and 1972, and 1973). The taxable base was calculated by subtracting a 100,000 personal deduction from gross earned income (less for manual workers and army personnel). See Ley 41/1964, Ley 18/1967 and Decreto-Ley 2/1968.

1968 – Tax on total income: income was exempted from tax if it did not exceed 200,000 pesetas or 300,000 pesetas (either individually or jointly) if all of the income came from personal work. The computed tax could not exceed 50% of the taxable base. Several tax credits were established: 25% of income from personal work up to 500,000, 20% of income exceeding this limit, maximum credit of 350,000; married, 40,000 (if total income was less than 1,600,000); per dependent child, 25,000. The total credits was computed by multiplying the sum of applicable credits by the effective tax rate (see Ley 41/1964 and Ley 18/1967).

1973 – Tax on earned income: the transition rates for manual workers and army personnel were adjusted again to: 9% in 1973, 11% in 1974, and an additional 1% for each subsequent

year until 14% was reached in 1977. For earned income exceeding 200,000 the rate of 14% applied (see Decreto-Ley 12/1972).
1974 – Tax on earned income: the flat rate was reduced to 12% for 1974 and beyond and set at 9% for the income of manual workers and army personnel below 200,000 for 1974 (see Decreto-Ley 12/1973).
1974 – Tax on total income: new tax schedule introduced, and the cap on the tax decreased to 40% of the taxable base (see Decreto-Ley 12/1973).
1975 – Tax on earned income: the 100,000 personal deduction was raised to 140,000 for those with earned incomes not exceeding 300,000 (see Decreto-Ley 6/1974).
1976 – Tax on total income: a new tax schedule was introduced, and the cap on the tax increased to 44% of the taxable base (see order issued in October 1976).
1977 – Tax on total income: a new tax schedule was introduced for 1977 and 1978, and the cap on the tax decreased to 40% of the taxable base (see Ley 19/1978).
1978 – Tax on earned income: the 100,000 personal deduction was raised to 170,000 for those who were married and had earned incomes not exceeding 315,000 (see Decreto-Ley 6/1974). This deduction also increased 20,000 for each dependent child, but this supplemental deduction could only be claimed by one earner in a two-earner family (priority given to male earner). A progressive emergency tax was also enacted for this year, which applied to earned income above 750,000.
Spain instituted a modern personal income tax (*Impuesto sobre la Renta de las Personas Físicas, IRPF*) on January 1, 1979. At this time, the family was the unit of taxation, meaning that all couples were required to file jointly.
In 1989, however, the use of the family unit was ruled unconstitutional, opening the way for individual taxation. Starting with the 1988 tax year, the individual has been the default unit for tax purposes. Even so, some continuity with the old system has been maintained—filing jointly remains an option for married couples. Note that the amounts and limits of deductions are usually not adjusted when two earners file jointly (e.g. the 250,000 threshold for the 5% earned income deduction is not doubled).
The tax information provided by the OECD is spotty for earlier years, particularly the 1970s and early 1980s. To fill in gaps and verify information, some of the original legislation has been examined. Here is a list of relevant legislation containing tax schedule by tax year.
1979 – Ley 44/1978, revised in Real Decreto 2615/1979, republished with revisions in Real Decreto 2384/1981
1980 – No change in tax schedule
1981 – Ley 74/1980
1982 – Ley 44/1981
1983 – Ley 9/1983
1984 – Ley 44/1983
1985 – Ley 50/1984
1986 – Decreto 212/1986
1987 – Ley 33/1987
1988 – Ley 33/1987
1989 – Ley 37/1988
1990 – Ley 5/1990
1991 – Ley 31/1990
1992 – Ley 18/1991
The tax information from the OECD was sufficient for the remaining years.

Note that the reform passed in June 1991 (Ley 18/1991) and effective in 1992 established two separate tax schedules for those filing as individuals and those filing as families (filing jointly remained optional for couples).
Beginning in 1997, the tax system was restructured so that income taxes were shared between the central government (85% of total taxes) and regional governments (15% of total taxes). Regions were granted some authority over two aspects of the tax code: the scale of the tax schedules and the design of tax credits.
The separate tax schedule for those filing jointly was eliminated at the start of the 1999 tax year. Consequently, those filing individually and those filling jointly used the same schedule.
The income taxes for couples are calculated both individually and jointly in 1989 and subsequent years (when individual taxation became the legal default and joint taxation became optional). Generally speaking, filing jointly is only advantageous in a one-earner family/household (e.g. the C1000 household always files jointly), though there are some exceptions. Both sets of calculations are includes in the tax worksheets.
From 1979 onward, those with incomes falling below a particular level do not have to file taxes. Following the OECD's approach, these thresholds are not taken into account when computing taxable income (i.e. all of the cases are assumed to file tax returns even if they have no obligation to do so). The past income limits were: 1979-82: 300,000; 1983-86: 500,000; 1987-88: 840,000 (doubled if filing jointly); 1989: 865,000 (doubled if filing jointly); 1990: 900,000 (doubled if filing jointly): 1991: 945,000 (doubled if filing jointly); 1992-94: 1,000,000 (1,200,000 if filing jointly or pensioner); 1995-96: 1,100,000 (1,200,000 if filing jointly or pensioner); 1997-98: 1,200,000 (1,250,000 if filing jointly or pensioner); 1999-2003: 3,500,000 (21,035.42 euros) (with important restrictions); 2004-2011: 22,000 (with important restrictions).
Allowances/Credits
The OECD series on wages and taxes served as the primary source for these sections. The article by Marco (2001), with its clear breakdown of allowances and credits by year from 1979-1999, also proved a valuable source of information.
Most of the deductions and credits are straightforward. The variable credit, in effect from 1985-87, is not clearly presented in the OECD material. A key point is that the taxable income figures (combined, the two spouses) are supposed to be expressed in 1,000s of pesetas.
For the tax years 1988-91, a new variable credit was implemented for two earners filing jointly. The multiplier for this credit varies depending on the two earners' combined income and the portion of this combined income attributable to the lowest-paid earner. The tables containing these multipliers are rather large and a simple formula to generate the multipliers is not readily available. Therefore, one must look up and enter each multiplier manually. The tables can be found in the following legislation:
1988 – Real Decreto-Ley 6/1988
1989 – Same as above
1990 – Order issued in November 1990
1991 – Order issued in July 1991
Correction: From 2007 the tax credits were updated
Minimum/Maximum Bases
For the purposes of social security contributions, there are minimum and maximum amounts of income that will be taxed. From 1963-1972, the minimum base was equivalent to the minimum wage. From 1973 onward, the minimum base has been set higher than the minimum wage and has increased in conjunction with minimum wage increases. To annualize

the monthly figures for minimum and maximum bases, one multiplies the figures by 12 rather than 14.
Note that the OECD altered its selection process for the maximum base, starting with the 1999 tax year. For years prior to 1999, the OECD used the maximum for the lowest occupational class paid on a monthly basis (assumed to be APW's occupational class). From 1999 onward, the OECD has used the highest maximum base. For the sake of consistency, the highest maximum base is used for all years in this data set.

Social Security Contribution Rates

Social security taxes were only levied on the legal wage set for each of the 12 occupational classes. The real wages that workers received was often higher than these fixed wage amounts, which meant that only a portion of their wages were covered by social insurance.
1967 – Prior to this year, contributions were collected separately by the central state and fragmented mutual societies (deemed to be part of the public system). Efforts were made to integrate these systems, and this is reflected in unified contribution rates instituted in this year (see Decreto 2946/1966).
1969 – The allocation of the contributions from employees and employers was updated and made clearer (see order issued in December 1968).
1972 – A five-year transition from the use of legal wages to real wages as the base for social security taxes was initiated. Two sets of contributions rates were used in this transition—one applied to the fixed wage for each occupational class and the other applied to the difference between the actual wage received and the relevant fixed wage (see Decreto 1645/1972).
1977 – Contributions started to be collected for a wage guarantee fund instituted the prior year (see Ley 16/1976, Real Decreto 317/1977). With the exception of one year, this tax has been paid entirely by employers.
From 1978-86, the contribution rates were altered nearly every year. The pieces of legislation outlining these changes have been collected. For the remaining years, the rates changed less frequently. The data for these years were obtained from SSPTW, OECD publications, and MISSOC.

Cash Transfers

1970-1991 – All families with dependent children, regardless of their incomes, received monthly cash transfers. The amount of each transfer was based on the number of dependent children. This universal benefit was terminated halfway through 1991. For this particular period, the figures on cash transfers were taken primarily from SSPTW and OECD Tax/Benefit (also see newspaper article from January 1971).
1991 – A new system was introduced that made cash transfers for dependent children a means-tested benefit. In order to qualify for this benefit, a family had to fall below a set income threshold. Initially, this threshold was set at 1,000,000 pesetas for one dependent child, with a 15% increase (i.e. 150,000) for each additional child. A family with an income slightly exceeding the relevant threshold was still entitled to a benefit, but at a reduced amount. Under these circumstances, the benefit amount was calculated using the following formula: (1,000,000+0.15*1,000,000*(n-1)+3,600*n) – gross income, where n is the number of dependent children. If the amount computed with this formula divided by the number of children was less than 3,000, then no benefit was paid (considered too insignificant) (see Ley 26/1990).
1995 – Beginning with this year, the income threshold started to increase every year (see Ley 1/1994). These increases usually appeared in legislation that revalued public pensions.
2000 – The amount of the cash transfer per dependent child was increased from 36,000 to 48,240 (291 euros). The benefit paid out in the prior year, 1999, was also retroactively

increased to 47,460—the difference between this amount and 36,000 was ultimately paid out as a lump sum. The minimum amount for the payout of the cash transfer was increased from 3,000 to 4,025 (24,25 euros).

Note that the means-tested benefits were considered taxable until they were made exempt income in 2007 (see Ley 18/1991, Ley 35/2006). For all practical purposes, however, families eligible for the means-tested benefit are too poor to have any tax liability. Therefore, the tax calculations in this data set do not treat this particular benefit as taxable.

Unemployment Insurance

1970 – The unemployment insurance in place in the early 1970s is outlined in several pieces of legislation from the 1960s. (see Ley 62/1961, Ley 193/1963, and Decreto 3158/1966). Starting on October 1, 1961, the replacement rate was set at 75% and the benefit base was tied to legal wages (structured by occupational class). There was a three-day waiting period before a worker could apply for unemployment benefits. All benefits received were exempt from income taxes and social security contributions.

1973 – The benefit base was changed from legal wages to actual wages (see Ley 24/1972, took effect on July 1, 1972). The three-day waiting period was eliminated (see Decreto 3090/1972, took effect on November 16, 1972).

1977 – The standard duration of unemployment benefits was increased to 52 weeks and the replacement rate for the special extension (26 additional weeks) was lowered to 60% (see Real Decreto-Ley 15/1976, took effect on October 1, 1976).

1981 – The standard duration of unemployment benefits was increased by another 26 weeks. A maximum benefit was also instituted for all recipients (220% of the minimum wage) and a minimum benefit was established for those with family responsibilities (equivalent to the minimum wage).

1985 – A minimum benefit was instituted for single workers (equivalent to the minimum wage) and the maximums were adjusted—lowered to 170% of the minimum wage for a single worker and 195% for a worker with one child. The standard and extended durations were also increased, with the extend benefit set at 75% of the minimum wage (see Ley 31/1984 and Real Decreto 625/1985, most provisions took effect on August 4, 1984, the duration and extended benefit changes took effect on January 1, 1984).

1993 – The replacement rate was reduced to 70% for the first six months and 60% for months thereafter (see Ley 22/1992, took effect August 5, 1992).

1994 – Unemployment benefits became taxable. For the purposes of calculating deductions and credits for income taxes, unemployment benefits were classified as earned income. In the calculation of social security contributions, a partial rate was levied on unemployment benefits (the core rate for pensions, sickness, maternity, etc.) (see Real Decreto 120/1994).

Corrections: Beginning in 1981 there were different minimum and maximum benefit rates for those with and without dependents. The benefit rates have been adjusted to reflect this. The minimum wage values used to calculate the gross unemployment benefit was updated for all years using official government values (IPREM). Updated gross wage values results in lower benefit levels in updated dataset.

Coverage – Data come from the Ministry of Labor.

CWEP update: we updated the qualifying conditions for unemployment benefits to reflect the 20-year contribution history of the notional worker. From 1970-1988 the qualifying condition was 26 weeks of contribution. From 1989-1994 the notional worker was eligible for the maximum duration of benefits with 208 weeks of contributions, and from 1995-2019 with 312 weeks of contributions.

Sick Pay

1970 – The sick pay available to workers in the early 1970s is outlined in several pieces of legislation from the 1960s (see Ley 62/1961 and orders issued in October 1967 and April 1969). Starting on January 1, 1967, the replacement rate was set at 75%, the benefit base was tied to legal wages (structured by occupational class), and the duration was limited to 18 months (with an extension of 6 months in special cases). There was a three-day waiting period before a worker could apply for sickness benefits, and benefits were not paid for spells lasting less than seven days. All benefits received were taxed like earned income.

Note that there were two types of sickness insurance with overlapping coverage—the conventional sick pay (*incapacidad laboral transitoria*) and temporary disability pay (*invalidez provisional*). Although these two forms of insurance served ostensibly different purposes, their eligibility requirements were essentially the same. As a consequence, it was generally possible for a worker to claim the temporary disability benefit after exhausting his sick pay benefit—the total possible duration being six years of benefits.

1973 – The benefit base was changed from legal wages to actual wages. Moreover, the duration of the conventional sick pay benefit was reduced from 18 to 12 months, though the six-month extension remained in place (see Ley 24/1972, took effect on July 1, 1972).

1980 – The benefit formula for sick pay was revised. Under the new formula, days 4-20 (i.e. after 3-day waiting period) were paid at 60% and the remaining time at 75% (see Real Decreto 53/1980, took effect on February 1, 1980).

1995 – The two types of sickness insurance (*incapacidad laboral transitoria* and *invalidez provisional*) were merged into a single program. The benefit's formula was not changed, but its duration was significantly curtailed—from 6 years total to 18 months total, with 30 months in special cases (see Ley 1/1994).

Coverage – Data come from the Ministry of Labor.

Standard Pension

In calculating the pension benefits, it is assumed that a worker retires at the beginning of a given year. This means that the last year of earnings is the year prior to the year of retirement.

1970 – The pension system in place in the early 1970s was initially designed in 1963 (see Ley 196/1961 and Ley 193/1963) and put into effect on January 1, 1967 (see Decreto 3158/1966). A detailed overview of the pension benefit and conditions are provided in the order issued in January 1967. The earnings base for the calculation of benefits was the average contribution base (this was regulated, varied by occupation) in a 24-month period (consecutive) in the preceding 7 years.

1973 – The benefit base was changed from legal wages to actual wages (see Ley 24/1972, took effect on July 1, 1972).

1974 – A minimum contributory pension was first instituted (see order issued in April 1974).

1983 – A minimum pension was first instituted (see order issued in April 1974).

The data for pension coverage are approximate because they are based on the types of pension rather then the age of pensioners. The first three columns show the number of pensioners in all types (e.g. old-age, disability, widow, orphan, etc.) and of all ages, broken down by contributory and non-contributory (these columns are just for reference). The next three columns show the number of pensioners receiving contributory and non-contributory pensions for retirement. Given that it is possible to retire before age 65 and the elderly can claim other types of pensions, these numbers to do not precisely capture the number of Spaniard aged 65

and over receiving a public pension. Sources: Estadísticas históricas de España: Siglos XIX-XX, Instituto Nacional de Estadistica.
CPI – This data comes from the Instituto Nacional de Estadistica.
Corrections: earned income allowances and work-related expense allowances removed from standard pension tax calculations. Social contributions not charged on pension income.

Minimum Pension
A guaranteed, non-contributory pension was introduced in 1991 (see Ley 26/1990, later incorporated into Decreto 1/1994). Prior to the introduction of this pension, those of retirement age not meeting the conditions for a contributory pension had to rely on social assistance. Given that there was (and still is) no national standard for social assistance (responsibility for the design and provision of this benefit rested with regions and municipalities), there was no universal right to a minimum old-age benefit prior to 1991.
Conditions – The sum of the recipient's income and assets (besides habitual housing) must be less than the amount of the minimum pension. If a recipient is married or has family responsibilities (i.e. has dependents), the resources of the entire household are considered. In this case, the threshold is increased by 70% of the benefit amount for each dependent. If the economic unit includes first-degree ascendants or descendants, the threshold is raised by a multiple of 2.5.
Amount – A fixed benefit amount is set each year. If there is more than one recipient of a minimum pension in a given household, a formula is used to reduce the additional benefits—each benefit beyond the first is equal to 70% of the first.
Subject to regular taxation rules, no social security contributions.
Corrections: earned income allowances and work-related expense allowances removed from minimum pension tax calculations. Social contributions not charged on pension income.
Gross benefit figures updated to reflect single and couple rates, when couples, values represent both spouses receiving the minimum benefit.

Coverage
Pensions: data on pension recipients from Ministerio de Trabajo y Economia Social (https://expinterweb.mitramiss.gob.es/series/) Includes contributory and non-contributory retirement pensions, social pensions and widows pensions.
UE/Sickness: data on contributors to social security from Instituto Nacional de Estadística (INE), on affiliated workers from Ministerio de Trabajo y Economia Social ()https://expinterweb.mitramiss.gob.es/series/
UE=General Regime+ Agrarian Regime + Public Sector
Sick=General Regime + Agrarian Regime + Public Sector
Other sources:
Spain in Figures (https://www.ine.es/ss/Satellite?c=INEPublicacion_C&cid=1259924856416&p=1254735110672&pagename=ProductosYServicios%2FPYSLayout&param1=PYSDetalleGratuitas&L=1)
Statistical Yearbook of Spain (https://www.ine.es/en/prodyser/pubweb/anuarios_mnu_en.htm)

Sources
Marco, Anabel Zárate. 2001. "La relación entre la tributación de diferentes unidades impositivas: una constante en el IRPF (1979-1999)." *Informacion Comercial Española, Revista de Economia*. 791: 153-174.

Sweden

Wages

The APW for 1982, 1980, and pre 1979 was estimated using the SAF hourly wage rate times a standard annual number of hours (40*52). For years 1982-90, such a series is consistent with (within less than 1%) of the OECD APW.
Post 2004 wages estimated from the APW based and change in OECD's AW series in Taxing Wages. Taxes were estimated for the APW using the available rules, summary tables or extrapolations. Tax data is generally from OECD, but also from the Swedish National Tax Board Research Unit (mimeo on file).
Corrections: The low earner tax credit was abolished in 2003 and EITC began in 2007. Net wages updated from 2003 to reflect this change.

Unemployment

Notes and Sources: For most years the ceiling is reached for the APW. For years before 1991, the max rate is 91.7%. For 1992 it is 90%, for 1993-1996 it is 80%. The changes in rates in the 1990s are taken from Goul Andersen ed. (2002) p. 136-7. The annual maxima back to 1968 are from the Swedish Unemployment Insurance Organization. Benefits are not taxed or subject to social contributions 1971-3, no social contributions 1976-1992, but yes thereafter.

Sickpay

Notes and Sources: Amounts are the sick benefit (without contractual supplement) amounts. Prior to 1973 ER amounts are based on income classes given in a Swedish tax history document (on file). From then, the amount is 90% to 1989, then rates fluctuate considerably from year to year. The maximum benefit level >7.5*BA is not relevant for APW. Data from 1996 on from RFV. From 1992, employers were made responsible for the first 2 weeks of sickness. This increased to 4 weeks in 1997 and 1998, and back to 2 weeks from April 1, 1998. From 2008, the benefit is given at 97% of the full amount. Between 1991-1995 there were multiple rates of benefits based on wages.
Corrections: updated formula used for benefit calculation 1991-1995. Updated social charges 1971-1973.

Minimum Pension

Sources: Basic Pension and Income-tested supplement from RVF (on file).
Notes: Amounts as of January 1 of year in question. Income-tested supplement program apparently does not exist until 1967. From 1993 to 1999, the basic pension amount was reduced by 2% off the top. Table provides an average housing benefit for pensioners, but it is not included in any calculations.
Taxes: It is assumed for all years that the amount of this pension is always below taxable minimum, or not subjected to taxes. Nordic Social Statistical Council's *Social Protection in the Nordic Countries* specifically notes no tax on the minimum benefit since at least late 1990s.
Corrections: the benefit is not subject to central taxes but is subject to subnational taxes from 2003.

Standard Pension

Notes and Sources: Amounts based on the rules in *SSPTW* up to 2003, since no terms of 1995 reforms are effective until that year. Various components of these computations are confirmed in conversations with authorities. Computations for early 1990s and late 1990s consistent with Hans Hansen (2002): *Elements of Social Security. A comparison covering: Denmark, Sweden, Finland, Austria, Germany, The Netherlands, Great Britain, Canada*. The Danish National Institute of Social Research 02:05. (http://www.sfi.dk/sw1317.asp)
New pension system information from various years of *Orange Report: Annual Report of the Swedish Pension System*. The new pension includes the private elements in the benefits.
Tax: The pension is considered fully taxable and not eligible for special deductions except for the early 1970s. (Special Deductions exist in principle, but where details are available, standard pension amounts imply no special deductions. For example, for 1999, Taxing Wages supplement provides no special pensioner deduction if pension>109K; our value for 1999 is 127K.) No social contributions.
Correction: Standard pension replacement rates updated due to a clerical error in CWED II.

Coverage

Pensions: Basic pensions paid. RVF (on-line) for data for 1991-1995. Other years from *Swedish Statistical Yearbook*. (Additional pensions—widows and disability from same sources.) Civil Servants are integrated into general scheme.
Swedish Pensions Agency:
https://www.pensionsmyndigheten.se/statistik/pensionsstatistik/?domain=tab-3&report=report-3-3&columns=APTot&rows=Time&timePointComparisons&sex=Samtliga&metrics=sumMeanLength&timeseries=2010-01-01&timeseries=2020-06-01&complete=false&childrows-store=
https://www.pensionsmyndigheten.se/statistik-och-rapporter/statistik/aldre-statistik-om-pension
Sickness: Number insured for earning-related benefits via qualified employment/activity. 1996-99: RFV website. Prior and years 2000 and 2001 from *Swedish Statistical yearbook*.
For 2002-2007 information on insured is missing from official publications.
For 2008-2018 *Social Insurance in Figures* lists the percentage of the insured population that has an income base for sickness benefits. From that we calculated the number of people insured (https://www.forsakringskassan.se/statistik/publikationer/socialforsakringen-i-siffror)
Unemployment: UE fund members from yearbooks.
IAF (Inspection for Unemployment Insurance) https://www.iaf.se/statistikdatabasen/
https://www.iaf.se/historisk-statistik/antalet-medlemmar-i-arbetsloshetskassorna---historiska-uppgifter/

Qualifying Conditions

SSPTW. But the following additions apply. Furarker (2002: 137) notes that waiting days for UE fell to 0 in 1988, and were raised back to 5 days in 1993. For sickness, the relevant dates are the same, but the wait was 1 day before 1988 and after 1993.
Pension retirement age: 65. While the earnings-related pension has traditionally been payable at 61 (now 62) given 30 years of contributions, the universal/guarantee pension is only payable from age 65 (and 40 years of residence).

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Magnus Sjöström, Socail Affairs Ministry. basic pension under the new pension system (for 2003)
Cecilia Udin, RFV, sick benefit info for 1991-5
Paul Klein, Dept of Economics Univ Western Ontario, municipal tax rates.

Websites
Swedish National Insurance Board http://www.rfv.se/english/
Statistics Sweden (incl. Statistical Yearbook) http://www.scb.se/default____2154.asp

Switzerland

Wages
There may be two different series used for the Swiss wage data. Prior to the *Taxing Wages* edition that covered tax year 1989, the APW wage reported was considerably lower than that reported since that time. (The description of how the APW was derived is identical across the break.) The corresponding wages for overlapping years between the 1989 and 1987 versions are 1986: 43900 (40900) and 1987: 44900 (42100). The former figure is the "Wage Rate, Business Sector in the OECD Economic Outlook data base, and we took that as the APW wage for all years from 1960-1987, estimating taxes from the descriptions in the Taxing wages information. (The APW taxing wages database-- sent to us by the OECD—has the break in the series is 1985; suggesting that they updated based on the published amounts in their prior publications.) From 2004 gross wages are based on APW estimates using TW average worker wages and are slightghly higher in CWEP updates.
General Note on Child Benefits included in replacement rate calculations: Child benefits are considered taxable income. In some years, the OECD appears to include the benefit as non-taxable.

Tax updates: work-related expense allowances have minimum and maximum values. Source: OECD Taxing Wages, various years from 1995.
Social Security allowances are the same for federal and subnational taxation (Source: Taxing Wages). In 2011 a child tax credit was introduced (Source: Taxing Wages). CWEP adds occupational pension charges and deductions to calculations.

Unemployment
Notes and Sources: Heidi Steiger, 2007, "Labour Market Policy in Switzerland: Institutions, Design, Effects." *SSPTW*, supplemented by information from MISSOC and Flora (*Growth to Limits)* on the transition to a proper UE regime. (Note: Steiger's account of policy in the early 1990s appears contradictory. The text claims that reductions in benefit after 85 and 170 payments were retained after the replacement rates went up, but the graphs suggest otherwise. Also, it mentions that the First revision was effective 1992, but graphs suggest effective 1990. We used the text.)
NB: The compulsory savings account deduction is listed in a second "SS" column. (It is included in SS for sickness benefits.
Update: According to the OECD Tax/Ben Model publications unemployment benefits are subject to the following contributions: accident insurance, occupational pension plans, and old age and disability scheme.

Sickness
Notes and Sources: Technically, the Swiss sickness cash benefit program has always been voluntary at federal level. While Cantons can make insurance compulsory, Peter Gross and Helmut Putner's chapter in Flora's *Growth to Limits* states that only about 25% are compulsorily covered in the early 1980s, and 96% are covered in practice. They suggest that there is a very low federal minimum sickness benefit, but this is irrelevant in practice. Until 1994 legislation (implemented in 1996), there was a provision in the law prescribing a low minimum standard for benefits; the details of the new legislation are somewhat unclear. It is not clear what the rates reported in Kangas cover.

A 2009 report (Heyman et al., 2009) indicates that Swiss labor law entitles employees to full paid sick leave for three weeks for a work history of 4-12 months, and courts applying the "Berne Scale" to extend the length for different lengths of job tenure. For 20 years service the length is 26 weeks, for 2 years of service, 4 weeks of sick leave.
(https://cepr.net/documents/publications/paid-sick-days-companion-2009-05.pdf)
Daily allowances for sickness are optional insurance (832.10 Federal law of 18 March 1994 on health insurance (LAMal)) and employers typically provide private insurance to employess paying 80% of wages according to the European Commission
(https://ec.europa.eu/social/main.jsp?catId=1131&langId=en&intPageId=4823).

Heymann, Jody, Hye Jin Rho, John Schmitt, and Alison Earle. "Contagion Nation: A Comparison of Paid Sick Day Policies in 22 Countries." *CEPR Reports and Issue Briefs*. CEPR Reports and Issue Briefs. Center for Economic and Policy Research (CEPR), May 2009. https://ideas.repec.org/p/epo/papers/2009-19.html.

Sickness benefits are not subject to social contributions, except for occupational pension contributions, since 2003. Source: Art. 6 (2) (b) of the Old-Age and Survivors' Insurance Regulations (https://www.admin.ch/opc/fr/classified-compilation/19470240/index.html)

Minimum Pension
Sources: Swiss Federal Social Insurance Office. There are two sets of replacement rates. The first is the full cash amount (excluding housing and in-kind benefits) of the social minimum. The other figure computed is the minimum AHV amount. The latter benefit is the nominally "universal" amount (though it assumes full insurance history).
Update: There is a limit of 150 percent of the maximum couple's benefit for combined individual pensions. Pensioners that rely only on the first pillar are entitled to an additional means-tested supplement that brings the minimum pension up to a minimum level of subsistence. Tables for minimum level of subsistence amounts are from the Swiss Federal Office of Statistics:
T4.2 calculation of Ergänzungsleistungen zur AHV:
https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.8766051.html
T3.1 bis T 3.4: Parameters of calculation:
https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.8766025.html
https://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbanken/tabellen.assetdetail.8766029.html

Standard Pension
Sources: Basic Structure and amounts and revaluation factors from Swiss Federal Office for Social Security and *SPPTW* and information. Revaluation of past wages based on revaluation factors provided by Office for Social Security.
Notes: Computed for the statutory public system only, (i.e., excludes compulsory defined contribution system). Replacement rate spreads include estimates of the individual account savings, but these are preliminary. Update: we added the supplemental second tier pension amounts from 1986 on.
Revaluation factors (Aufwertungsfaktoren) for the calculation of standard pensions from AHV (https://www.ahv-iv.ch/de/Merkbl%C3%A4tter-Formulare/Diverse-Listen/Aufwertungsfaktoren)

Update: up to 1992 the standard pension was made up of a fixed amount plus a variable percentage of revalued lifetime earnings, subject to minimum and maximum values. From 1993 the fixed and variable amounts differ with the level of revalued earnings. Sources: communications with BSV and Schweizerische Sozialversicherungssta_s_k: https://www.bsv.admin.ch/bsv/de/home/sozialversicherungen/
Occupational Pensions:

Coverage
Pensions: 1975-2002: AVS rentes de vieillesse. Office federal des assurances sociales. 2003. *Statistique des Assurances Sociales Suisses 2003*, p. 83 (Table AVS 2). Data for 1960-1969: “Total Old Age Pensions.” Flora, vol 4. p 661. Civil Servants are integrated into general scheme.
BSV Federal Social Insurance Officehttps://www.bsv.admin.ch/bsv/en/home/social-insurance/ahv/statistik.html
https://www.bsv.admin.ch/bsv/de/home/sozialversicherungen/ueberblick/grsv/statistik.html

Unemployment: (not compulsory until 1977) Data for 1960-1976 from Flora, vol 4, p. 663. Data from 1977-2000 from BSV communication. (Number of recipients greatly exceeds open unemployed in almost all years with data.)
BSV Federal Social Insurance Office
https://www.bsv.admin.ch/bsv/de/home/sozialversicherungen/ueberblick/grsv/statistik.html

Sickness: 1960-2001: Office federal des assurances socials, *Statistique de l’assurance-maladie 2001*, Table 8.02, p. 135 and (1960-1996) Office federal des assurances socials. 2003. *Statistique des Assurances Sociales Suisses 2003*, p. 155 (Table AM 5.1). 1997-2000: Estimated figures provided by Swiss Social Security Office.Data for 1950-1970, excluding 1960, 1965 and 1970, from Flora.
BSV Federal Social Insurance Office
https://www.bsv.admin.ch/bsv/de/home/sozialversicherungen/ueberblick/grsv/statistik.html

Qualifying conditions
Sickness: SSPTW, MISSOC (from 2003), Rho, Hye Jin, John Schmitt, Alison Earle, and Jody Heymann. 2009. “A Review of Sickness-related Leave in 22 High Human Development Index Countries," Center for Economic and Policy Research Briefing Paper.
Pensions: SSPTW, MISSOC (2003)
UE: Steiger (2007, 23-26), SSPTW, MISSOC (from 2003), OECD (from 1994 reform, longer benefits for being in ALMP are not included).

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Agnes Nienhaus and Valérie Ruffieux, Bundesamt fuer Sozialversicherung (BSV). Information on sickness and UE insurance coverage in recent years.
Stefan Mueller, BSV. Information on calculation on the Swiss pension, including indexation of past wages.
Nicole Gerner Fellay, legal service for SECO (Swiss Secretariat for Economic Affairs). Information about the history of Swiss Unemployment insurance coverage
Queisser and Vittas, "The Swiss Multi-pillar pension system: triumph of common sense?" World Bank Development Research Group Working Paper, Aug. 2000

Steiger, Heidi, 2007, *Labour Market Policy in Switzerland: Institutions, Design, Effects*. Ph.D. Dissertation, University of St Gallen, Department of Business, Economics, Law and Social Science.

Websites:
Federal Office for Social Security http://www.bsv.admin.ch/

Taiwan

Wages
The APW wages are based on average monthly earnings of employees of nonagricultural industries (industry and service) in *Monthly Bulletin of Earnings and Productivity Statistics*.

Taxes
Income tax rates and taxable bands (1986-2011) are from National Taxation Bureau of Taipei, Ministry of Finance
(http://www.ntat.gov.tw/etwmain/front/ETW118W/CON/879/5702201758651492080?tagCode=)
However, information on tax allowance and tax credit was not available.

Unemployment
Taiwan introduced the rules for unemployment benefits under the Labor Insurance Act in 1999 to cope with sudden increase in unemployment triggered by the Asian financial crisis. The first law was implemented on 1 January 1999 but was amended soon on 30 July 1999. The level of the monthly UE benefit payments increased from original 50% to 60% of the insured monthly salary. Its duration was also extended from the original three months to six months. The gross replacement rate and duration are coded 50% and three months respectively as of April 1 in 1999. There was no additional allowance for unemployed workers with dependents until 2008. After the 2009 amendment, an unemployed person with an unemployed spouse and/or underage or impaired children has been paid an additional 10% of average insured monthly salary per dependent, up to an additional 20%. In addition, the insured age ceiling increased from 60 to 65 years old, and duration increased from 6 months to 9 months only for the middle aged (45-65) (Council of Labor Affair, 2009).
According to the Employment Insurance Act, unemployment insurance is exempt from taxation.
All data and information are from SSPTW and the Bureau of Labor Insurance (www.bli.gov.tw). The min/max contribution wages were informed by communication with the Bureau of Labor Insurance.

Sickness
All data are from *SSPTW*.
Sickness benefit program is operated under the Labor Insurance Act (LIA) promulgated in 1958. Since sickness benefit is financed from the Labor Insurance Program which covers old-age benefits, the coding sheet does not include the contribution rate. (see the coding sheet for the standard pension) Sickness benefit is equal to 50% of the insured's average covered earnings in the 6 months before the incapacity began. To receive sickness benefit, specified minimum qualifying period is not required, but medical certification must be provided. If the insured contributes less than 1 year (52 weeks), he/she will be paid for only 6 months; if over 52 weeks, up to 12 months.
Maternity benefit had been paid only to an insured female worker who has premature or postmature birth until June 2011. From July 1, 2011, in any case of childbirth, an insured female worker is entitled to claim maternity benefits. Maternity benefit is paid in the form of a lump sum grant which is equal to one month of her previous wage.

Standard Pension

Information is from *SSPTW* and the Bureau of Labor Insurance.

The Labor Insurance Program has provided the old-age pension benefits to people who are above 60 and have worked for at least 15 years. However, before the enforcement of Labor Insurance Pension (LIP) on January 1, 2009, the old-age benefits had been paid at once as a form of a lump sum. The amount of a lump sum was equal to 1 month of the insured's average covered earnings in the 36 months before retirement for each year of contributions for the first 15 years, plus 2 months of the insured's average covered earnings in the 36 months before retirement for each year of contributions exceeding 15 years (the highest limit was 45 months). The new law which came into force on January 1 2009 accepted monthly pension approach in the LIP. The monthly old-age pension benefit is calculated by two ways: A) average monthly insurance salary × coverage years × 0.775% + NT $3,000 or B) average monthly insurance salary × coverage years × 1.55%. The insured person can select the better benefits between two methods. "Average monthly insurance salary" is calculated by averaging the highest 36 months (before 2008) or 60 months (after 2009) of insurance salary during the insurance coverage years.

In October 2008, the National Pension Act was implemented to insure people who have never participated in any national insurance programs such as the LIP, Government employees' insurance and Insurance for Military Personnel. In the NPI, as the LIP, the old-age pension benefit is calculated by two ways: A) average monthly insurance salary × coverage years × 0.65% + NT $3,000 or B) average monthly insurance salary × coverage years × 1.3%. The NPI old-age benefit is slightly lower than the LIP old-age benefit. In the coding sheet, standard pension refers to the LIP.

Minimum Pension

The National Pension Insurance also provides an old-age basic guaranteed pension for the one who did not participate in any pension programs. The old-age basic guaranteed pension are paid for citizens who 1) are above 65 years, 2) have been residents of Taiwan for more than 183 days per year for the last 3 years, 3) are not recipients of any social welfare allowances, and 4) pass a means-test (income and asset test). The amount of the old-age basic guaranteed pension was NT$ 3,000 per every month until 2001. The amount increased from NT$ 3,000 to NT$ 3,500 from January 2012.

Coverage

The number of insured persons of Labor Insurance (sickness) and Employment Insurance (unemployment) is from the Statistical Yearbook of the Republic of China 2012 (http://www.stat.gov.tw).

United Kingdom

Wages
Wages for the years 1982, 1980, and prior to 1978 are estimated from changes in the UK earnings index. (Data is from Statistics UK). Taxes for these years (generally only needed for APW) are estimated from tax tables provided from mimeos provided by John Ball, UK Dept of Work and Pensions (they appear to all come from official publications). Wages for later years from OECD *Taxing Wages* statistics, and APW series estimated from the later AW series. Taxes are based on OECD *Taxing wages* series descriptions.

Unemployment
Sources: Flat benefit portions for 1960-1996 from Institute for Fiscal Studies "UE benefit rate" series, with additions for dependent spouse and children where applicable. For years from 1966-1981, the earnings-related benefit is based on replacement rate and earning limit data from *SSPTW* and from UK Department of Work and Pensions. From 1997, benefits are based on Job Seekers Allowance which has rates for single and couple. There was a child supplement, but it was withdrawn for a tax credit starting in 2004.
Notes: For some years, especially after the earnings-related addition was abolished, the unemployment benefit for a year is less than the income support/supplementary benefit amount. We use the non-income tested benefit rates as they are most comparable to the unemployment insurance (non-means-tested) programs in other countries.
Taxes: These benefits are untaxed before 1981, and then (on their own) are too low to generate a tax liability.

Sick pay
Notes and Sources: Up to 1983, the amounts are the same as UE insurance. From 1984 to 1989, the benefit combines the statutory sick pay (SSP) benefit for 8 weeks and the "sickness benefit" provided by IFS for 16 weeks. Sickness benefit is only paid after the SSP expires. From 1989, SSP is extended to 28 weeks, so only the SSP rate is counted in the benefit column. Data provided by DWP, IFS, and SSPTW.
Taxes: These benefits are untaxed before 1981, and then (on their own) are too low to generate a tax liability. Subject to social security charges.

Minimum Pension
Sources and Notes: 1960-1988: The amount is the long-term supplementary rate (from IFS). From 1988-1999, amount is the personal income support allowance plus pensioner premium (also from IFS). For 2000-3, the amount is the minimum income guarantee (MIG). For 2004 to the present, it is the Pension Guarantee Credit (PGC). (Data on MIG and PGC from UK Dept of Social Security). All of these rates are means-tested.
Sources: https://www.ifs.org.uk/tools_and_resources/fiscal_facts

Standard Pension
Notes and Sources: This combines benefits for several different systems depending on the year. Before S(tate) E(arnings) R(elated) P(ension) S(ystem) (SERPS), the pension combines the flat rate with the graduated benefit. (Details of the graduated pension are provided by Kevin Hughes of UK DWP Analytical Services Division.) After that, three pensions amounts (flat, SERPS and graduated) are all used to compute the pension due. (From 2002/3, there is

also a second state pension "top-up" added to the pension contributions made for low income workers contributing to contracted-out occupational and personal schemes. These are not considered here as that do not apply to our APW worker.) From 2013, the State Second Pension is calculated as a flat rate portion plus an earnings-related portion up to the value of the Upper Acrual Point (AUP). The formula is:
Flat rate + revalued earnings (up to UAP)*10%/45 year career
See: https://adviser.royallondon.com/technical-central/pensions/state-benefits-pension-manuals/state-second-pension-explained/#:~:text=Band%201%20%2D%20Benefit%20accrues%20at,(half%20what%20SERPS%20provided). From 2016 the benefit is the New State Pension or previous formula, whichever is greater.
**April values are used for UK case rather than the January rule applied to other cases due to data availability
Sources: https://www.ifs.org.uk/tools_and_resources/fiscal_facts
https://www.gov.uk/government/collections/abstract-of-statistics-for-benefits-national-insurance-contributions-and-indices-of-prices-and-earnings
https://www.pensionspolicyinstitute.org.uk/
Tax: Taxed as normal income, though there are special pensioner allowances in most years.
Corrections: Replacement rate for standard pension in 1997 and minimum pension in 1994 were corrected to reflect accurate benefit amount.

Qualifying conditions
SSPTW
Sickness/UE: where applicable, qualification, duration and wait for the ER benefit is used. The qualifying time in recent years appears to be based on a multiple of the minimum insurable earnings. The time in weeks is approximated by taking the 50/[APW/52/(minimum weekly insurable amount)]. In 1995, the qualifying conditions for short-term incapacity benefit are the same as for the old sickness benefit.
Update: Duration of benefits only for Statutory Sick Pay (SSP). SSP was provided for 8 weeks from 1983 and up to 28 weeks of social insurance benefits, and 28 weeks from 1987.. Short-term disability benefit is replaced by Employment Support Allowance (ESA) for new entrants from 2008. ESA benefits are paid for a 13-week assessment period and then paid according to incapacity assessment. In principle, ESA can be paid to retirement age if continually assessed as working/support group, so for the purposes of this project ESA is of unlimited duration.
CWEP update: From 2009-2020 the sick benefit (Short-term Incapacity Benefit) is replaced by the Employment and Support Allowance.

*Pension*s: The qualifying period for a full pension is not straightforward. "Working life" theoretically implies the period from secondary school-leaving to retirement age (16-65). Up to 1975, one needed to have contributions averaging 50 weeks, or full-time work for about 47 of those 49 years. After 1975, the number of "full time" years required was lowered to 44 of the 49 years.
However, only contributions given since the start of the program in 1948 are considered in the averaging calculations, so it took fewer years of paying pension insurance to fully qualify (e.g., 50/52*(1961-1948)~13 years in 1961. So, by construction, the maximum qualifying condition for CWEP is 90% of working life (49 years), or 44 years.
Update: the New State pension goes into effect for those reaching state pension age as of April 2016. Although the New State pension only requires 10 years to qualify, we combine

the requirements for the different programs and thus combine the qualification periods to 44 years.

Coverage

Pensions: *Annual Abstract of Statistics*. (1950-60 from Flora, using same sources as us.) DWP: Stat-Xplore https://www.gov.uk/government/organisations/department-for-work-pensions/about/statistics#employment-support-schemes

UE: from 1960-1974, National Insurance Contrib. for UE from *Annual Abstract of Statistics*. From 1975, Class 1 NI contributors from same source. (1950-60 from Flora, using same sources as us.) Civil Servants are integrated into the general regime.
Sickness: from 1960-1974, NI contrib. for sickness from *Annual Abstract of Statistics*. From 1975-97, Class 1 NI contributors from same source. (1950-60 from Flora, using same sources as us.) From 1997, online Contributions and Qualifying Years tabulation tool. http://83.244.183.180/NIRS/live/cq/tabtool_cq.html

Update: From 1999 statistics on employment from Office for National Statistics, includes public sector employment.
https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/g7go/pse
https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/ycjy/lms
https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/g7f5/pse
https://www.gov.uk/government/statistics/abstract-of-statistics-2018

Social Contributions

Social contributions that finance pensions, sickness and unemployment cash benefits are those paid by Class 1 National Insurance contributors and are reported as a global contribution in the "Other Contribution" category.

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Websites

Institute for Fiscal Studies http://www.ifs.org.uk/
Department of Work and Pensions (Information and Analysis Directorate, formerly Analytical Services Division) http://www.dwp.gov.uk/asd/
National Statistics UK http://www.statistics.gov.uk/

United States

Wages
US wage series in Taxing Wages do not imply a large breaks between 1978-9, etc. so it is used throughout. Years prior to 1972 estimated based on SSA average wage series.

Unemployment
Notes and Sources: Unemployment replacement rates are taken as 50% of APW. (Taking an average of net replacement rates by state produces something largely similar.)
Tax: benefits are taxable from 1987. State tax data for Michigan (calculation state for tax purposes), from Michigan Dept of Treasury for 86-95. Local tax data from OECD taxing wages from 1995-, estimated burdens for 1986-1994. Later years from Taxing Wages. Benefits are only subject to income tax, not SS charges. Earned Income Credits are only on the wage portion of benefit, but are tapered on total income (including the benefits)

Sickness
No national sickness or maternity pay program, though a few states (e.g., California, New York, and New Jersey) have state sick pay programs.

Minimum pension
Sources: Maximum Supplemental Security Income (SSI) benefit from Social Security Annual Statistical Supplement 2000 (Table 2B). Includes maximum food stamp benefits for one- and two- person households, since these are payable for all qualifying elderly on SSI (from US Department of Agriculture).
Prior to 1972, there was an old-age assistance program run under joint state-federal auspices, but details are not investigated here. Old Aged in SSI are automatically enrolled in Food Stamp program. Not taxed.
https://www.ssa.gov/oact/cola/SSIamts.html

Standard pension
Notes and Sources: Pension amounts computed on APW wage history using Social Security Administration's detailed Primary Insurance Amount (PIA) calculator (http://www.ssa.gov/OACT/ANYPIA/description.html). Households with a dependent spouse draw a spousal supplement equal to 50% of the breadwinner's pension. Wages for years before 1972 estimated on change in the average wage given in Social Security Annual Statistical Supplements.
https://www.ssa.gov/planners/retire/AnypiaApplet.html
Tax: Benefits are taxable in principle, but only with considerable income from other sources. For the cases considered here, they are untaxed.

Coverage
Sickness: Coverage for those under programs for temporary disability (5 states only) Statistical Abstract of the United States (Estimated Workers under Social Insurance) and Historical Statistics of the United States: Colonial Times to 1970 Table H48-56.
UE: Data from 1975 from the Department of Labor's "Covered Wage Series." Prior years from Statistical Abstract of the United States (Estimated Workers under Social Insurance) and

Historical Statistics of the US (H48-56). This slightly underestimates coverage, since it excludes some protected under federal government only.
https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables
https://www.bls.gov/cew/downloadable-data-files.htm
Pensions: 1954-1970: Historical Statistics of the US. (Table H376-381) Proportion of 65+ in receipt of OASDHI plus portion of 65+ in receipt of OAA (Old Age Assistance). 1975, 1980, 1985: Table 3C5 in the 2003 Annual Statistical Supplement data for over 65 OASI (Old Age Security Insurance) recipients and aged Supplement Security Income recipients. From 1995-present: Social Security Administration, Annual Statistical Supplements (various years) Where specific breakdown is not available, "SSI only" is assumed to be 40% of total SSI. (Civil Servants are formally only partly integrated, and only since the 1980s. However, LIS surveys suggest that few people report receiving "public sector pensions" but no "public social insurance pension" even in the late 1960s.)
Additional: Information on unemployment benefits, social security coverage and public pensions from Statistical Abstract.
https://www.ssa.gov/cgi-bin/currentpay.cgi

Qualifying Conditions
SSPTW, supplemented with Social Security Administration Annual Statistical Supplements (for pensions) and Bureau of Labor Statistics information on unemployment insurance programs.

Acknowledgements
Kirk Mueller, DOL Economist Current Employment Statistics. Information on unemployment insurance coverage
Joseph Bondar, Social Security Administration. Information on pension take-up.

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Social Security Administration www.ssa.gov
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Scruggs, Lyle. 2014. “Social welfare generosity scores in CWED 2: A methodological genealogy.” *Comparative Welfare Entitlements Dataset Working Paper*, 1, pp.1-19.OECD. 2005. *Taxing Wages 2003-2004*, Paris: OECD.