INSTITUTE for RESEARCH on POVERTY
UNIVERSITY OF WISCONSIN–MADISON

IRP Discussion Paper

No. 1419-14

Post-1970 Trends in Within-Country Inequality and Poverty: Rich and Middle Income Countries

Salvatore Morelli
CSEF, University of Naples and INET Oxford, University of Oxford

Timothy Smeeding
University of Wisconsin

Jeffrey Thompson
Federal Reserve Board of Governors

March 18, 2014

The authors wish to thank their organizations for support of this work. In particular we thank especially David Chancellor and also Dawn Duren of IRP for their assistance with graphs and manuscript preparation, and Peter Frase for research assistance. We would also like to thank Tony Atkinson, Francois Bourguignon, Michael Forster, Andrew Leigh, Max Roser, Stephen Jenkins, and the editors for helpful comments on an earlier draft, and Andrea Brandolini for providing helpful inequality trend data. The authors and not their organizations are responsible for all opinions in this chapter, as well as all errors of omission and commission.

Abstract

This paper is prepared as a chapter for the Handbook of Income Distribution, Volume 2 (edited by A. B. Atkinson and F. Bourguignon, Elsevier-North Holland, forthcoming). Like the other chapters in the volume (and its predecessor), the aim is to provide a comprehensive review of a particular area of research. We examine the literature on post-1970 trends in poverty and income inequality, up to 2010 or 2011 in most countries. We provide measures of the levels and trends in each of these areas, as well as an integrated discussion of empirical choices made in the measurement of poverty, overall income inequality, and inequality amongst those with top incomes.

TABLE OF CONTENTS

Post-1970 Trends in Within-Country Inequality and Poverty:
Rich and Middle Income Countries

1. INTRODUCTION

The chapter on "Post-1970 Trends in Within-Country Inequality and Poverty" was rather sketchy 13 years ago when the first edition of the HID was published (Gottschalk and Smeeding, 2000). A separate chapter was devoted to poverty measurement (Jäntti and Danziger, 2000). The first Canberra Report (2001) on international standards for income distribution, much less the second Report (2011) had not yet been published, and the Luxembourg Income Study database had under 15 years of comparable data on poverty and inequality for less than 20 rich nations, where only trend data from 1980–1995 was available. The OECD method for collecting comparable income distribution data was in its infancy, and the top incomes database was even younger still as Thomas Piketty (2001) was just publishing his paper on the long-run distribution of top incomes in France.

The data world has come a long way in 14 years with multiple sources of comparable (harmonized) household income data (overall and top incomes), wealth data, and poverty data. Even heeding the warnings to take caution with harmonization of secondary data (Atkinson and Brandolini, 2001), the world now has a substantial number of more-comparable data series, both across nations and over time. Still there are limits to what can be accomplished in terms of comparisons. Here we rely on high-quality comparable level and trend data for income and income poverty from the 1970s on. While our measures dwell heavily on OECD countries, using both Luxembourg Income Study (LIS) and the most recently available OECD data, particularly for the richest of these nations, improved availability has allowed us to add some data for "developing" nations and "Middle Income Countries" (MICs).[1]

Two other chapters in this volume cover longer-term trends in inequality and developing country inequality (Chapters 8 and 10). Another focuses on the effects of policy on poverty (Chapter 24). We will

[1]We include Brazil, Bulgaria, China, Chile, India, Hungary, Romania, South Africa, Turkey, and additional nations in some of the analysis, based on the LIS data (http://www.lisdatacenter.org/) or the OECD data (www.oecd.org/social/income-distribution-database.htm)

overlap to a small degree with these chapters. As argued below, our income and poverty measures will be based on commonly defined and measured disposable income as well as pretax income for tax records. Consumption data are not yet comparable enough to use in cross-national analysis; wealth data comparability has begun, but not yet flowered. There are only scattered cross-national studies of wealth or asset poverty. While the European Union and some OECD studies consider indices of material deprivation, such measures are not standardized enough in the rest of the world to be examined here, as elaborated in the next section where we select yardsticks.

Next we turn to income poverty measures, mainly those based on data from the Luxembourg Income Study (LIS) and the OECD, where we examine levels, trends, and both anchored and relative poverty. We then turn to the topic of overall income inequality levels and trends, based on these same sources, before turning to top end inequality measures. In so doing we attempt to bridge the divide between household income distribution data, from surveys and registers, and top income data based on taxable income and income tax units, highlighting the extent of complementarity and substitutability between the two. Our final section summarizes our review and the conclusions we draw.

2. CHOOSING A YARDSTICK AND ITS COMPONENTS

Multiple perspectives can be used to evaluate the distribution of living standards in a society. These focal points, as labeled by Sen (1992: 20), include monetary indicators, such as expenditure, income and wealth, as well as non-monetary indicators like multidimensional measures of material standard of living, happiness and life satisfaction, functioning, and capabilities. Here disposable income is taken as the focal variable for overall inequality and poverty trends, and taxable income records for tax filing units which permit long run and accurate investigations of the incomes of the top strata of society.

The distribution of income among persons, or households, has attracted the attention of social scientists at least since Gregory King's 1688 social tables, "which offer unique quantitative views of social structure and income distribution during a statistical Dark Age" (Lindert and Williamson, 1982). Pareto's analysis of the revenue curve in 1897 is a more recent formalization of this interest. Income is

still the most common indicator of economic resources in rich countries. While consumption expenditure is often used in developing countries, the Hicks-Hansen identity for income (or potential consumption) being equal to actual consumption plus the change in net worth[2] over a given period ideally ties income and consumption neatly together. But no one dataset contains fully comparable measures of all three ingredients in any nation, mainly because change in net worth is difficult to measure (see also Brandolini and Smeeding, 2009; and Fisher, Johnson, and Smeeding, 2012).

2A. Consumption or Income?

The nearest alternative to disposable income is consumption or consumption expenditure, a variable which is often preferred in less developed countries since it is more easily measured in such localities. Consumption can be smoothed over time and therefore is less volatile and less reliant on seasonal variation than is income, especially in agricultural societies (Deaton and Grosh, 2000). Apart from this practical reason, many economists view consumption as a better proxy of well-being than income (Fisher, Johnson, and Smeeding, 2012). One argument is that well-being (utility) is a function of the goods and services actually consumed, not those merely owned (Slesnick, 1994). However, focusing on the means available to purchase commodities (income) rather than the commodities actually purchased (expenditure) makes the assessment of well-being independent of the purchase choice. Sen offers the example "... of the person with means who fasts out of choice, as opposed to another who has to starve because of lack of means" (1992: 111–112), while Hagenaars and colleagues (1994: 8) argue that using income helps us avoid the trap of confusing voluntarily low levels of consumption with material deprivation.

A second argument in favor of consumption is that it is more closely related to permanent income or lifetime resources than current income. As described by Friedman (1957: 209), the distributions of

---

[2]Change in net worth can be positive, net income saved, or negative, net debt incurred.

current income "… reflect the influence of differences among individual units both in … the permanent component of income and … the transitory component. Yet these two types of differences do not have the same significance; the one is an indication of deep-seated long-run inequality, the other, of dynamic variation and mobility." If one is interested in "deep-seated long-run inequality," permanent income and, hence, consumption, is what matters. However, the simple proportionality between consumption and permanent income in the baseline inter-temporal consumer's optimization problem does not hold if some of its basic hypotheses are relaxed and simple forms of personal heterogeneity are introduced (effects of accumulated or inherited wealth, the degree of inter-generational altruism, the variability of uncertain labor incomes, and capacity to borrow, to name just a few). Therefore, current consumption may not be a very good, and not even the best available, proxy of permanent income. Moreover, it is far from obvious that "deep-seated long-run inequality" should be our major concern. The concept has some natural appeal: an undergraduate may have current income below that of a manual worker of the same age, but she is likely to be better off within a few years, and for most of her lifetime. But "the promise of resources in the future may do little to pay the bills today" (Deaton and Grosh, 2000: 93). In the real world, capital markets are imperfect and units face borrowing constraints that render the actual standard of living dependent on currently available resources. Conversely, "... the fact that an old person had a high income thirty years ago does not make up for his having a pension that is below his needs today" (Atkinson, 1983: 44).

Finally, there is the problem of measurement of "true" consumption in rich societies. Consumption expenditure data are collected mainly to provide weights and prices for measuring the Consumer Price Index, not for measuring consumption. Very few surveys actually try to measure actual consumption, because purchases of durables such as major appliances, automobiles, and especially housing must all be spread out over the useful life of the good which is bought in one period but consumed in another. Indeed, measures of consumption may differ greatly from consumer expenditures for such persons as older individuals living in an owned but mortgage-free house (Meyer and Sullivan, 2012a, 2012b; Fisher, Johnson, and Smeeding, 2012; Johnson, Smeeding, and Torrey, 2005).

In brief, there is a priori no cogent or practical reason to prefer consumption to income, or permanent income to current income. Indeed Haig (1921) and Simons (1938) recognized that income represents the possibility to consume, and therefore established their famous identity that income equals consumption plus or minus changes in net worth. Most often, the choice is driven by the available information and there is a clear preference among rich nations to rely on income and not consumption. Middle income countries are also increasingly likely to have living standards better measured by incomes, especially in their rapidly growing urban areas. Indeed, if the value of informal labor is captured (including production for own consumption) then income and consumption differ only by changes in net worth, which may be small in the less modern regions of middle income countries. Our income data on middle income countries below is based on such an income definition. Current income therefore appears to be a satisfactory measure of the (material) living standard of people.

After settling on income as the focal variable, however, a number of important conceptual issues and data concerns remain. In addition to the issues of data availability over time and comparability across countries, the analysis of distributional measures requires decisions and assumptions regarding the income concept, the income-sharing unit, the accounting period, and statistics for measuring poverty, material hardship, or the distribution of income (Smeeding and Weinberg, 2001; Johnson and Smeeding, 2013).

2B. The Income Definition and Other Essentials

The most basic income concepts collected by national statistical agencies and used by researchers are market ("factor") or pre-tax and transfer income and disposable income. On the basis of the recommendations of the reports of the Expert Group on Household Income Statistics–The Canberra Group (2001, 2011), market income should include all types of earnings gross of employees' social

insurance contributions, net self-employment income,[3] all types of capital income including interest, rent or dividends received (but not accrued), and subtracting interest paid, plus private pensions.

Disposable income takes market income and subtracts direct taxes (including an employee's contributions to social insurance), but ignores other "indirect" taxes (property, wealth, and value-added taxes); then it adds back in regular inter-household cash transfers received net of those made, and all forms of cash and near-cash public income transfers including social insurance benefits (for social retirement, disability, and unemployment), universal social assistance benefits, and targeted income transfer programs like social maintenance. Near-cash benefits in the form of housing allowances or food stamps are included as are negative taxes (for instance in-work benefits now popular in many rich nations).[4]

However broad these definitions might be, they exclude imputed rents, capital gains and losses and other unrealized types of capital income, home production, and in-kind transfer benefits such as education and health insurance. Because these items may account for an important share of the economic resources at the household's disposal, their inclusion in the income definition may affect measured inequality. Indeed, research on the United States suggests that uncounted realized and unrealized income from capital raises measured incomes by over 40 percent at the mean and more than 20 percent at the median (Smeeding and Thompson, 2011).

Imputed rent for owner-occupied dwellings tends to benefit a wide range of low- to high-income units, especially the elderly, but their overall effect may vary across countries, depending on the level of housing prices and the diffusion of home-ownership (Frick and Grabka, 2003). Unrealized appreciation

---

[3]All surveys net out the costs of producing self-employment income, but none also deduct the costs of earning wage income, such as child care. More generally, traditional household income data cannot account for the cost of foregone home production, especially when parents switch their work from household income to market earnings, as has taken place widely in rich countries since the 1970s. Because of the change in modes of production, and the failure to account for the direct and opportunity costs of earning incomes, the rise in secondary earners among partners with children probably overstates their net income gain when both partners work.

[4]In practice, many surveys also exclude various elements of market incomes, such as interest paid, or private transfers made to other households, and therefore these are often ignored.

and untaxed income from capital, as well as capital gains, mainly benefit higher income units. Indirect taxes have a relatively larger impact on the budget of lower-income units (Newman and O'Brien, 2011). But the opposite happens with the imputation of in-kind public benefits for health care, housing, and education valued at their cost of provision. As the value of these benefits is spread more or less evenly among beneficiaries ("potential" beneficiaries in the case of health insurance), the typical approach is to augment income by a fixed amount, which accounts for a larger fraction of income at lower income levels (Burkhauser, Larrimore, and Simon, 2012). In general, elder households and households with children are net gainers from the imputation, through health insurance and education benefits, respectively, while middle age childless units are net losers (Garfinkel, Rainwater, and Smeeding, 2006; 2010). These results are very sensitive to the imputation assumptions: both valuing benefits according to willingness to pay and accounting for the quality of services provided would lower benefits to the poor (Smeeding, 1982).

As stressed in the first Canberra Group Report (2001: pp. 62–67), the undercoverage of property and self-employment income, own account production, imputed rent for owner-occupied dwellings, social transfers in-kind, capital gains and other unrealized income from wealth are major issues to be addressed in expanding internationally comparable income measures. But the analysis of these augmented notions of income is also scarce at the national level. Despite these omissions and shortcomings, market income and disposable household income remain the standard concepts measured and published by national statistical agencies and research institutions.

2B.i. Reference Period, Income Units, and Resource Sharing

Income is a flow of resources received by people over a given period. To have a coherent income concept that can be used to compare distributions across countries and analyze trends over time requires common units to describe the period over which income is received and the groups of people who are sharing the income.

The statistics and trends analyzed in this section are all based on annual data, in part due to convention and data availability. The choice of the reference period does, however, have implications for

the degree of inequality in the distribution measured at any given point in time. In the presence of fluctuations in income, where some households experience positive or negative shocks, or lumpy income streams, the distribution of income will appear more unequal the shorter the reference period (Atkinson, 1983; Atkinson, Rainwater, and Smeeding, 1995). At intra-annual frequencies, income may fluctuate owing to seasonal factors (e.g., in agriculture), movement of workers into or out of jobs, or the timing of payments (e.g., interest on financial assets or liabilities, dividends on stocks). Aggregating over the year implies averaging out these differences, although the overall impact on measured inequality may be small (Böheim and Jenkins, 2006). By the same token, lengthening the reference period beyond the year reduces measured inequality by smoothing the variability due to the business cycle or the life-cycle (e.g., Björklund, 1993; Björklund and Palme, 2002). Longer periods of time may come closer to approximating the "lifetime income" concept preferred by some economists, but in practice these data are quite rare. Using Swedish data, Björklund (1993) found that the dispersion of four decades worth of cumulative income data for individuals was up to 40 percent lower than dispersion measured from a standard cross-section.

Income is typically shared across family or household units. Analysis of the distribution of income across countries and over time requires both adjustments for the economies of scale associated with income sharing, and also use of comparable income units. The typical income receiving unit is the household, but some data sources report income for individuals, families, or tax-paying units, which potentially include individuals, families, and sub-family units. The broader the definition of household, the more measured inequality tends to decrease, since the dispersion of individual incomes is abated by their aggregation and supposedly egalitarian distribution among all members of the unit (Redmond, 1998). The poverty trends discussed below in Section 3 and the distributional measures for the entire population discussed in Section 4A are based on household income surveys, and use the household as the income unit. The trends in high income shares discussed in Section 4B are typically based on tax-paying units, since they are commonly based on national income tax statistics, and multiple tax units may be included in one household.

It is widely accepted that there are greater costs associated with larger households and economies of scale in consumption that are generated by cohabitation. A family with two children faces greater costs than a family with one child, with greater expenses for food, clothing, education, transportation, and housing. As a result, the same level of after-tax income implies a lower material standard of living for the larger family. With economies of scale in a household, though, providing for the second child will not be as costly as for the first. Similarly, a couple living together will spend more on housing, utilities, food, and transportation than a single person, but the couple does not need to spend twice as much to obtain the same standard of living, cet. par.

To account for costs associated with household size and the related economies of scale, researchers have developed different "equivalence scales" to create comparable incomes of different household sizes and compositions. The most commonly used equivalence scale, taken from Buhmann, et al. (1988) and further described by Atkinson et al. (1995) and recommended by the Canberra Group, divides household income by the square root of the household size. Using the square root scale, costs rise with the household size, but at a declining rate. The square root scale, though, does not explicitly acknowledge differences in the cost of living between adults and children. The LIS Project uses the square root scale, and the OECD has used it in its publications since 1995. The EU uses an alternative scale when calculating distributional statistics with the SILC data (Atkinson et al., 2010). The scale used by the EU divides household income by the weighted number of household members, with different weights applied to adults and children. The household head is given a weight of one, each additional adult household member a weight of 0.5, and each child a weight of 0.3.[5] The U.S. Census Bureau has adopted a three parameter equivalence scale that further differentiates between children in different household types. The Census scale, discussed in Short (2001), reflects the idea that children in single parent families represent a greater increase in costs than do children in two-parent families.

[5]The equivalence scale used in the Eurostat figures is sometimes referred to as the "modified" OECD equivalence scale, as it supersedes another scale previously used by the OECD. (see http://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf)

The choice of the equivalence scale affects inequality comparisons. And it also affects poverty comparisons, especially between those who typically live in small units (elders) or larger units (families with children, or multigenerational units) (Buhmann et al., 1988; Coulter et al., 1992).

Finally, the welfare weighting of the single observations may vary. Each observation may receive a weight of one (household-weight) or may be weighted according to its size (person-weight) or its size and composition (equivalent adult-weight), again bringing differences in poverty and inequality outcomes (Danziger and Taussig, 1979; Ebert, 1997).

2C. Data Source Comparability: Surveys, Tax Records, and the Rich

The last cause of limited comparability may be attributable to differences in the source of data. Income data are available both from national household surveys, and from administrative archives. Of the latter, the most important are income tax records, which have historically provided long runs of continuous data, exploited in the literature on top incomes (Atkinson and Piketty, 2007). Income tax records suffer from potentially serious problems, among which the incomplete coverage of those with incomes below the tax threshold, inability to adjust for household size, and the tendency to under-report certain types of income. These and other methodological issues related to tax records and calculation of top-income shares are discussed in greater detail in Section 4B.

Household surveys are also subject to problems, including sampling error, which depends on the size and structure of the sample, and non-sampling errors, caused by non-response and under-reporting (Atkinson et al., 1995: Chapter 2). For these reasons, the upper tail of the income distribution tends to be unsatisfactorily covered in sample surveys, unless the rich are over-sampled and reporting errors are minimized. The survey-based evidence discussed later in this chapter may be seen as being about the incomes of the bottom 95–99 percent of the population, and it is thus complementary but not always fully

comparable to the results on high incomes based on tax records reported in the final section of the paper.[6] The specific statistics used in the calculation of poverty and income inequality using the household survey data are discussed below in Sections 3 and 4A.

All these factors need to be kept in mind in the analysis of the national trends in income inequality or in cross-national comparisons. While the data include a great deal of "noise" or possibly unknown errors, the important assumption is that the signal derived from the analysis exceeds the noise for most careful analyses which also include sensitivity tests of assumptions (Atkinson et al., 1995; Gottschalk and Smeeding, 2000). In examining trends we are aided by the fact that errors may be more consistent across multiple rounds of the same survey and therefore trends may be more cross-nationally reliable and comparable than levels of inequality (Gottschalk and Smeeding, 1997). But even then, almost all surveys undergo often substantial changes over multiple decades, producing artificial changes in results due to changes in sampling, survey mode, or other changes in procedures.

Finally, full comparability is an impossible goal. Surveys within countries as well as across countries are subject to changes in methods, and are characterized by differences in sampling and non-sampling errors. Comparability is vastly increased when the researcher can access the individual observations on household incomes available in a national archive, or in international databases where the original databases are harmonized such as the Luxembourg Income Study (LIS) and the European Union Statistics on Income and Living Conditions (EU-SILC). Here both levels and trends are more comparable than using other methods. Ex-ante instructions to compute a series of harmonized data are also available from the OECD (2008, 2011, 2013).

Since 1983, the LIS Cross-National Data Center (LIS) has been creating "harmonized" income data sets for a growing number of countries. LIS works with the existing income surveys of different countries and converts them to a format with consistent definitions and concepts that make cross-national

[6]Data may be bottom and top coded, either in the course of the collection of the data as in the U.S. Current Population Survey (Ryscavage, 1995), or as a decision of the researcher to reduce the noise that is typically concentrated in the tails of the distribution (Cowell and Victoria-Feser, 1996; Burkhauser et al., 2009).

comparisons possible. By way of non-disclosure agreements and secure remote access servers, LIS also makes research access possible to income surveys from a number of countries that traditionally do not share their underlying data. By 2012, LIS included 8 different waves of harmonized data covering roughly equivalent points in time between 1967 and 2010 across the countries. The initial LIS wave included 7 countries, but the number has grown steadily, reaching nearly 40 countries in the most recent waves.

The European Union's statistical agency, Eurostat, provides comparable income survey statistics for the member countries of the European Union. Eurostat initially used a common survey instrument across the European counties, but has since switched to an "ex-ante harmonized" framework (Atkinson et al., 2010). The European Community Household Panel Survey (ECHPS) covered 15 different countries from 1994 to 2001, and was replaced by the Statistics on Income and Living Conditions (SILC). SILC works through the statistical agencies of the different EU member countries, and achieves cross-national comparability through adoption of common definitions and concepts key to cross-national comparability of income and other policy-relevant matters in the EU.[7] In 1995 there were 13 countries initially represented, but the number of countries expanded to 22 by 2000, and 30 by 2005. The Eurostat-produced income distribution measures now cover 32 different countries. In contrast to LIS, the Eurostat distribution statistics are produced annually; covering the years between 1995 and 2011 there are 380 year-country observations for the different distributional measures.

[7]Even within this common framework, there are important differences in the approaches the different EU countries use in their SILC income surveys. See Iacovou, Kaminska, and Levy (2012) for a detailed discussion of some of the weaknesses of the EU-SILC data and potential problems for using these data for cross-national analysis. Several EU countries (Finland, the Netherlands, Norway, Slovenia, and Sweden) use administrative records supplemented with interviews of representative household members. Most of the countries use rotational panel household surveys, but there is considerable variation in the number of rotation groups and length of time in the panel. In most of the countries the length of the panel is four years, with one rotation group dropped every year, but Norway and France have eight- and nine-year panels, respectively, and Luxembourg uses a traditional panel. Spain and Ireland use substitutes for non-responders in their household survey. Prior to 2008 Germany used a combined quota and random sample for its survey.

The OECD also regularly releases income distribution and poverty measures for its member countries. These releases have been highlighted in major publications, including *Growing Unequal?* (2008), *Divided We Stand* (2011), and *Crisis Squeezes Income and Puts Pressure on Inequality and Poverty* (2013), and are also available in the organization's Household Income Distribution and Poverty online databases (www.oecd.org/social/inequality.htm). The OECD figures are based on the national statistical agency household surveys, and are created by a network of country specialists using common measures.[8] Since the figures are calculated from country-specific surveys in different years, the data are not always based on the same years. In several of these publications, the OECD data compares fairly well with the LIS data observed in the same year, but then the OECD methods add more-up-to-date data to that available from LIS. In the mid-1970s 8 countries were represented in the distributional statistics, but by the late-2000s the number of countries had grown to 34. Because these data tend to be more immediate and can be updated with less ex-post harmonization than, say, LIS, we use OECD (2013) poverty data to capture the effects of the Great Recession on poverty below.

3. POVERTY MEASUREMENT AND TRENDS

In this section, we examine the complexities of poverty measurement from its origins to current practice. We rely mainly on the LIS and OECD data to examine levels and trends in overall poverty, but also refer to the literature on child and elder poverty. In our empirical examinations we look at both rich and middle-income countries, comparisons of trends in relative poverty over different time periods, comparisons of relative and anchored poverty across the Great Recession (GR), and finally the correlation

[8]At least some of the surveys used by both OECD and LIS are household surveys combined with samples drawn from administrative registers in the Nordic nations, Austria, France, and Denmark. These data suffer from less item non-response and reporting error than most household surveys, and include a full random sample of all households, including the top 1 percent, thus also improving on nonresponse and data quality. Because so much of the income gain in the last two decades has been at the top end of the distribution, these national register data might have become systematically different from the normal survey data in these databases. See OECD (2012) for a list of their surveys based on registers, compared to other types of sample surveys. See also Atkinson et al. (1995: Chapter 2) for a more general discussion.

between levels of relative poverty and inequality as an introduction to Section 4 on overall income inequality.

3A. Origins and Development of Poverty Measurement

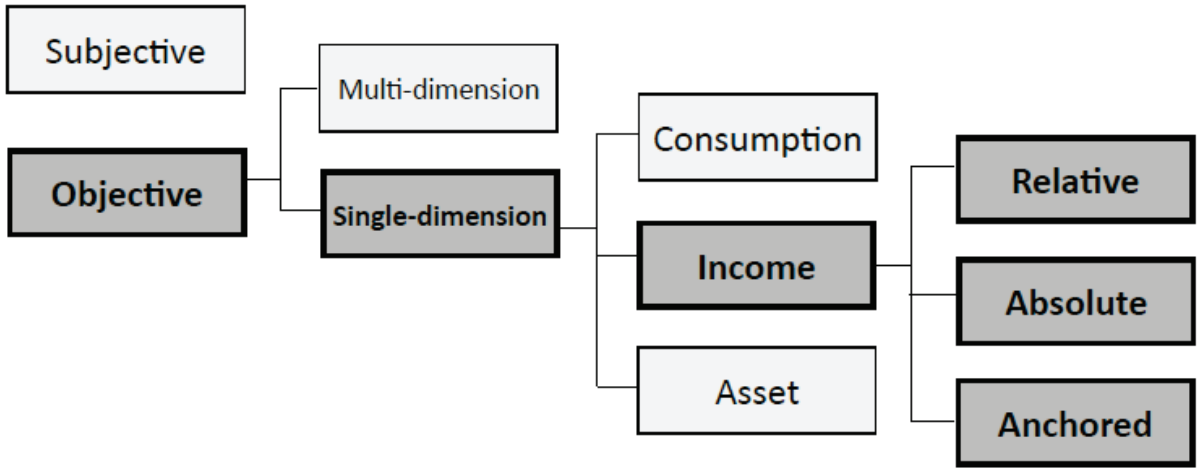
The fundamental concept of poverty concerns itself with having too few resources or capabilities to participate fully in a society. As Blank (2008) reminds us, "poverty is an inherently vague concept and developing a poverty measure involves a number of relatively arbitrary assumptions." Ultimately, social scientists need to first establish the breadth and depth of this social phenomenon called "poverty" before they can meaningfully analyze it and explore its ultimate causes and remedies. Thus, we turn to measures and comparisons of poverty employed by economists and other social scientists within and across nations.

Our discussion is framed by Figure 1, which reviews most of the possibilities of poverty concepts and measures. Here we are mostly interested in the concept of objective poverty measures, according to some standard definitions of means versus resources.[9] In this chapter, we are mostly interested in objective poverty measurement using a single dimension of 'resources,' income, and several notions of 'needs' standards: those that are relative, absolute, and, closely related, anchored poverty lines. We choose income poverty because of its domination in modern (post-1960s) poverty studies and because of its linkages to the income inequality literature that follows. Other measures and concepts of poverty are also mentioned, but not empirically investigated.

Income or living-standards poverty measurement began in the Anglo Saxon countries and dates back at least to Rowntree (1901), who was the first to employ the concept of a poverty line in his empirical work on York, England. And thanks to his enterprise, and that of Booth (1903) who invented the idea of a poverty line for London, we have a meaningful social indicator of basic needs (see for instance, Townsend, 1979, 1993; Piachaud, 1987; Ringen, 1985; Ravallion, 2014). We also note that

[9]See also chapter 24, "The Idea of Antipoverty Policy" by Ravallion (2014) on the origins of poverty in economic thought and the role of anti-poverty policy and social protection in meeting basic human needs.

Figure 1. Conceptualizing Poverty and its Measurement



Source: Adapted from Dhongde (2013).

official poverty measurement began as an Anglo-American social indicator. But since then, "official" measures of poverty (or measures of "low income") now exist in over 100 countries and for Europe as a whole (Eurostat, 2005). The United States (DeNavas-Walt et al., 2012) and the United Kingdom (Department for Work and Pensions, 2012) have long standing "official" poverty series. Statistics Canada publishes the number of households with incomes below a "low-income cutoff" on an irregular basis, as does the Australian government with those below the "Henderson line." In Northern Europe and Scandinavia the debate centers instead on the level of income at which minimum benefits for social programs should be set. In other words, their concept of insufficient "low income" is directly fed into programmatic responses to social needs (Björklund and Freeman, 1997; Marx and Nelson, 2013; Ravallion, 2013).[10]

While poverty measurement is an exercise that is particularly popular in the English-speaking countries, most rich nations share the Anglo-Saxon concern over distributional outcomes and the well-being of the low-income population. There is no international consensus on guidelines for measuring poverty, but international bodies such as the United Nations Children's Fund (UNICEF, 2000), the United Nations Development Programme (UNDP, 1999), the Organization for Economic Cooperation and Development (OECD, 2008; 2013), and the European Statistical Office (Eurostat, 1998; 2005), have published several cross-national studies of the incidence of poverty in rich countries. The large majority of these studies have been based on the Luxembourg Income Study (LIS) database which can be accessed at www.lisdatacenter.org. Some examples of these studies include Förster (1993); Jäntti and Danziger (2000); Smeeding, Rainwater, and Burtless (2000); Kenworthy (1998); and Smeeding, O'Higgins, and Rainwater (1990); and Smeeding (2006). More recently the European Union (2005) and the OECD have regularized measurement of poverty but using different standards and data sources. Today one can find

[10]In addition to these objective poverty measures, several economists have used subjective measures of poverty and well-being, including income sufficiency (Ravallion, 2012; van Praag, 1968; Groedhart et al., 1977; Hagenaars and van Praag, 1985).While we do not cover these types of measures here, they are much akin to the chapter on subjective well-being and inequality later in this volume (Clark and D'Ambrosio, 2014).

poverty measures in over 100 countries, and some harmonized measures from the World Bank that use both secondary (published) data- and micro data-based measures of consumption and income to determine those living below some particular amount of income per person day, from $1.25 to $2.00 (Ravallion and Chen, 2011b; Chen and Ravallion, 2012).

3B. Measuring Poverty

Most broadly, the measurement of poverty in rich nations involves the comparison of some index of household well-being with household needs. When command over economic resources falls short of needs, a household (or person or family) is classified as poor. Well-being refers to the material resources available to a household. The concern with these resources among most social scientists is generally not with material consumption per se, but rather with the capabilities such resources give to household members so they can participate fully in society (Sen, 1983, 1992; Brandolini and Smeeding, 2009). These capabilities are inputs to social activities, and participation in social activities gives rise to a particular level of well-being (Rainwater, 1990; Coleman and Rainwater, 1978). Methods for measuring a person's or household's capabilities differ according to the context in which one assesses them, either over time or across nations or among subpopulations within a nation, e.g., rural versus urban China.

All advanced societies are highly stratified and, hence, some individuals have more resources than others. The opportunities for social participation are affected by the resources that a household disposes, particularly in nations like the United States where there is heavy reliance on the market to provide such essential services as health care, post-secondary education, and child care. Money income is therefore a crucial resource. Of course, there are other important kinds of resources, such as social capital, wealth, noncash benefits, primary education, and access to basic health care, all of which add to human capabilities (Coleman, 1988). These resources may be available more or less equally to all people in some societies, regardless of their money incomes. There are many forces in rich societies which reduce well-being by limiting capabilities for full participation in society, including inadequacies in neighborhoods where people live, racial and ethnic discrimination, neighborhood violence, low-quality public schools

and other social services, lack of good jobs, and job instability, all of which increase economic insecurity, reduce human capabilities, and increase poverty.

Because there is no single commonly accepted way to measure poverty among social scientists there is a desire to go beyond the popularly used income poverty definition employed below. And so there exists a wide variety of additional poverty measures which substitute for or complement the preponderance of income-based measures used by quantitative sociologists and economists (e.g., see Haveman, 2009; Ruggles, 1990; Boltvinik, 2000). In principle, poverty is a multidimensional concept and should reflect several aspects of personal well-being as shown in Figure 1. Forms of deprivation other than economic hardship can certainly be relevant to poverty measurement and to anti-poverty policymaking. A number of authors have suggested that separate measures of needs ought to be developed for different goods and services (Aaron, 1985). Housing and health care are often mentioned in this context, though the latter is particularly of interest in medically unequal nations such as the United States, while the former is of much greater interest in the United Kingdom (U.K., 1993).

The concept of multi-dimensional poverty is also flourishing. Official measures of social exclusion, material deprivation, and material hardship exist mainly in Europe, though they are beyond the empirical bounds of this chapter. Europe adopted the official Laeken set of social indicators in 1995, including the at-risk-of-poverty indicator, with an explicit objective of reducing poverty and social exclusion (Marlier et al., 2007). Indeed, indicators of material deprivation now form part of the Europe 2020 target of poverty reduction (Atkinson and Marlier, 2010: Chapter 6).

Both consumption poverty and asset poverty have been proposed as an alternative to income poverty in rich nations (Meyer and Sullivan, 2012a, 2012b; Brandolini, Magri, and Smeeding, 2010). And in a few nations, asset and income poverty can be combined into a joint measure (Gornick et al., 2009) as can consumption and income poverty (Meyer and Sullivan, 2012a, 2012b). But consumption and asset poverty measures are not yet ready for widespread use on a cross-national basis, despite their usefulness for some types of poverty measurement (e.g. many income-poor elderly consume more than their incomes due to dissaving and spending from assets).

In summary, we are interested primarily in comparative cross-national poverty measured in income terms. Not only because income-based poverty measures are more comparable across nations, but also because income-based poverty allows us to connect our empirical work to overall inequality per se in the rich and MIC nations observed in this chapter. As mentioned above, income is generally a better measure of resources than consumption in rich countries. In the rapidly growing middle income countries, the differences in living standards between rural and urban populations cause the most angst over consumption versus income poverty. But the richer the country, the more income becomes a better and more comparable measure. At the frontier of such comparisons, LIS work on 'production for own consumption' and 'informal labor' income help ease the comparisons across diverse areas within nations.

3C. Measuring Absolute, Relative, and Anchored Poverty in Rich and Selected Middle Income Countries

An absolute poverty standard is defined in terms of a level of purchasing power that is sufficient to buy a fixed bundle of basic necessities at a specific point in time. A relative standard, on the other hand, is defined relative to the typical income or consumption level in the wider society. The purchasing power of a relative poverty standard will change over time as society-wide income or consumption levels change, while an absolute poverty standard will change only with the prices of commodities it can buy. Most cross-national comparisons use the relative definition of poverty, especially since purchasing power parities to convert any absolute measure to country currency are subject to fluctuation and sometimes severe measurement error (Jäntti and Danziger, 2000).

And, in the broadest sense, all measures of poverty or economic need are relative, because context is important to the definition of needs. The World Bank uses poverty measures of $1.25 to $2 per person per day—or $1,095 to $2,190 per year for a family of three—for the developing nations of Africa, Central Asia, or Latin America (Chen and Ravallion, 2012). In contrast, the 2011 United States "absolute" poverty threshold was about $18,000 for a family of three—8 to 17 times the World Bank's poverty line, while one-half of median income, the preferred relative poverty standard in the United

States, is another 25 percent above this poverty line or 10 to 21 times the poverty standard in poor countries. Moreover, as economic inequality has increased in most rich societies over the past 20 years, the study of relative deprivation and poverty has taken on a new life (Gottschalk and Smeeding, 2000; Gornick and Jäntti, 2013; OECD, 2011, 2013).

Cross-national comparisons of poverty in rich countries therefore rely heavily on relative concepts of poverty, which are a reflection of the fact that a poverty standard or a minimum income standard ought to reflect the overall standard of living in society. One early source of this formalization (Abel-Smith and Townsend, 1965) came about in arguing that the officially defined minimum level of income in the United Kingdom, as represented by the National Assistance scale, should increase with the rising standard of living, and not just with consumer prices. It was Townsend's work in the early 1960s culminating in his famous 1979 book that really launched the relative poverty approach on a much wider scale.

As Townsend (1979: p. 31) wrote:

> *"Individuals, families and groups in the population can be said to be in poverty when they lack the resources to obtain the type of diet, participate in the activities and have the living conditions and the amenities which are customary, or at least widely encouraged or approved in the societies to which they belong."*

The measurement of relative poverty has more recently been generally operationalized with a definition of the poverty line as a fraction of median income. Cross-national studies typically compare the percentage of persons living with income below some fraction of the family-size-adjusted national median income.

Measurement of relative poverty in the United States also began in the 1960s and was pioneered by Fuchs (1967) who followed the thinking of Townsend and Abel-Smith and linked relative and absolute income poverty measurement. When Fuchs began his study, the absolute poverty measure in the United States begun by Lampman (1964) and then Orshansky (1965) was based on a poverty line of about

$3,000 for four persons. Fuchs pointed out that this was half of median income at that time and that one could think differently about relative poverty compared to absolute poverty (Gilbert, 2008: p. 136).[11]

A relative poverty measure comparison is also consistent with a well-established theoretical perspective on poverty (Sen, 1983, 1992; and again Townsend, 1979). However, the fraction of income at which the poverty line ought to be set is open to debate. Most cross-national studies (LIS, OECD) focus on half of the median income, following Fuchs and others. But many feel that a 50-percent-of-median standard is too low. It implies a poverty cut-off well below half the mean in unequal societies,[12] and it also affects the country rankings.[13] The European Statistical Office Working Group on Poverty Measurement has employed 60 percent of the national median income as the common poverty threshold for European Community poverty studies in the new millennium (Eurostat, 2005, 2011).

A fully relative measure of poverty changes in lock step with median income, while an absolute measure changes only with prices. The income elasticity of the poverty line is therefore between zero for the absolute measure and one for the fully relative measure. In some countries, such as the United States, the measure of poverty has become 'semi-relative' as the poverty line advances only with the living standards of the bottom part of the distribution and not the whole distribution (Short, 2012). Ravallion and Chen (2011a) refer to "weakly relative measures" which have the feature that the poverty line will not rise proportionately to the median or mean, but will have income elasticity less than unity. These are also called "quasi-relative" poverty standards in the new "Supplemental Poverty Measure" for the United

---

[11]Lampman's chapter "The Problem of Poverty in America,'' (Council of Economic Advisors, 1964) preceded President Johnson's declaration of the "War on Poverty" in his 1964 State of the Union Address. But while Lampman used $3,000 of money income for his measure, it was not adjusted for family size. Orshansky (1965) produced a measure that had a similar poverty count, and a similar poverty line for a four person family, but which differed by family size. In the late 1960s, Orshansky's measure became the official U.S. poverty.

[12]Most relative poverty or deprivation measures rely on the median not the mean income, especially in cross-national studies, because the latter may be affected by sampling and non-sampling error in different surveys. Moreover the reference to the standard of living enjoyed by the middle or average family means the median family. See Smeeding et al. (1990).

[13]See LIS key figures for country poverty rates at 40, 50, and 60 percent of the median, at http://www.lisdatacenter.org/data-access/key-figures/search/) and compare rankings there with European community rates from Eurostat (2012).

States, which varies by considering expenses on basic needs for a low-income family and how they change over time (Short, 2012).

It is worthwhile to understand both absolute and relative poverty measures because they tell different things about living standards as well as deprivation. Increasingly, the idea of 'anchored' poverty measures have become important and can be employed to indicate both relative (or weakly relative) and absolute poverty trends within a given nation. Anchored poverty measures begin with the same fully or weakly relative measure in one year (t) and then compare relative poverty in some future year (say year t+10) to poverty measures against a poverty line that has been changed only for prices between year t and year t+10. These measures are especially useful in periods of rapid expansion *or* contraction in an economy, where relative poverty may not change by a lot, but where absolute poverty does change due to economic growth or contraction (see Atkinson et al., 2002; Smeeding, 2006; Johnson and Smeeding, 2012; OECD, 2013). Any absolute poverty line is also therefore an anchored poverty line. The difference is that an anchored poverty line can be updated to any period which is policy relevant, given the analysis. As suggested above, the absolute (or anchored) U.S. Orshansky poverty line for the 1960s was about the same as a fully relative half median income measure at that time. The United States has anchored its 'official' poverty measure at this same point since that date. Now 60 years later, the U.S. poverty line is only at about 30 percent of median income, not the 50 percent it was at its inception. Hence, analysts prefer to anchor their U.S. poverty studies at a semi-relative line (Johnson and Smeeding, 2012).

Here, for simplicity and breadth, we focus exclusively on the "headcount" measure of poverty, the share of people who fall below some definable point that indexes poverty. This approach does not measure the depth of economic need, the poverty gap, or the severity of poverty. People who are poor could become richer or poorer, with no change in a headcount measure of poverty. A pragmatic reason for using the poverty gap is that the headcount may be quite sensitive where there are spikes in the distribution, due to the payment of flat-rate social transfers such as minimum social retirement level (or

changes to the minimum wage).[14] Others, see especially Sen (1976) and Foster, Greer, and Thorbecke (1984), focus on poverty measures that examine the distribution of poverty among the poor, taking account of both the depth of poverty and its severity. Because headcount measures are more easily understood, compared, and implemented than other, more complex measures, we rely on them below.

The data we use are taken from LIS and sometimes OECD, and are limited mainly to rich and middle-income countries. The OECD includes a large number of rich nations, but also Chile, Mexico, and Turkey. Both LIS and OECD have been interested in the 'BRICS' countries (Brazil, Russia, India, China, and South Africa). LIS has also expanded to include other Latin American nations and Mexico. But in order to establish trends in income poverty, one must have at least a decade or two of data, and here the number of middle income countries we can examine is severely limited.[15]

3D. Level and Trend in Poverty

We examine the level and trends in poverty in a set of graphs and one table, all based on the LIS key figures dataset, plus some special tabulations to determine the level of anchored poverty using both LIS and OECD data. The percentage of persons living below the half-median poverty line can now be examined for 38 nations using the LIS data (Figure 2). The 28 light-shaded nations are the richest Anglo-Saxon, EU, and OECD nations; the 10 darker bars are for the MICS: Russia, the BRICS nations, and several South American nations.[16]

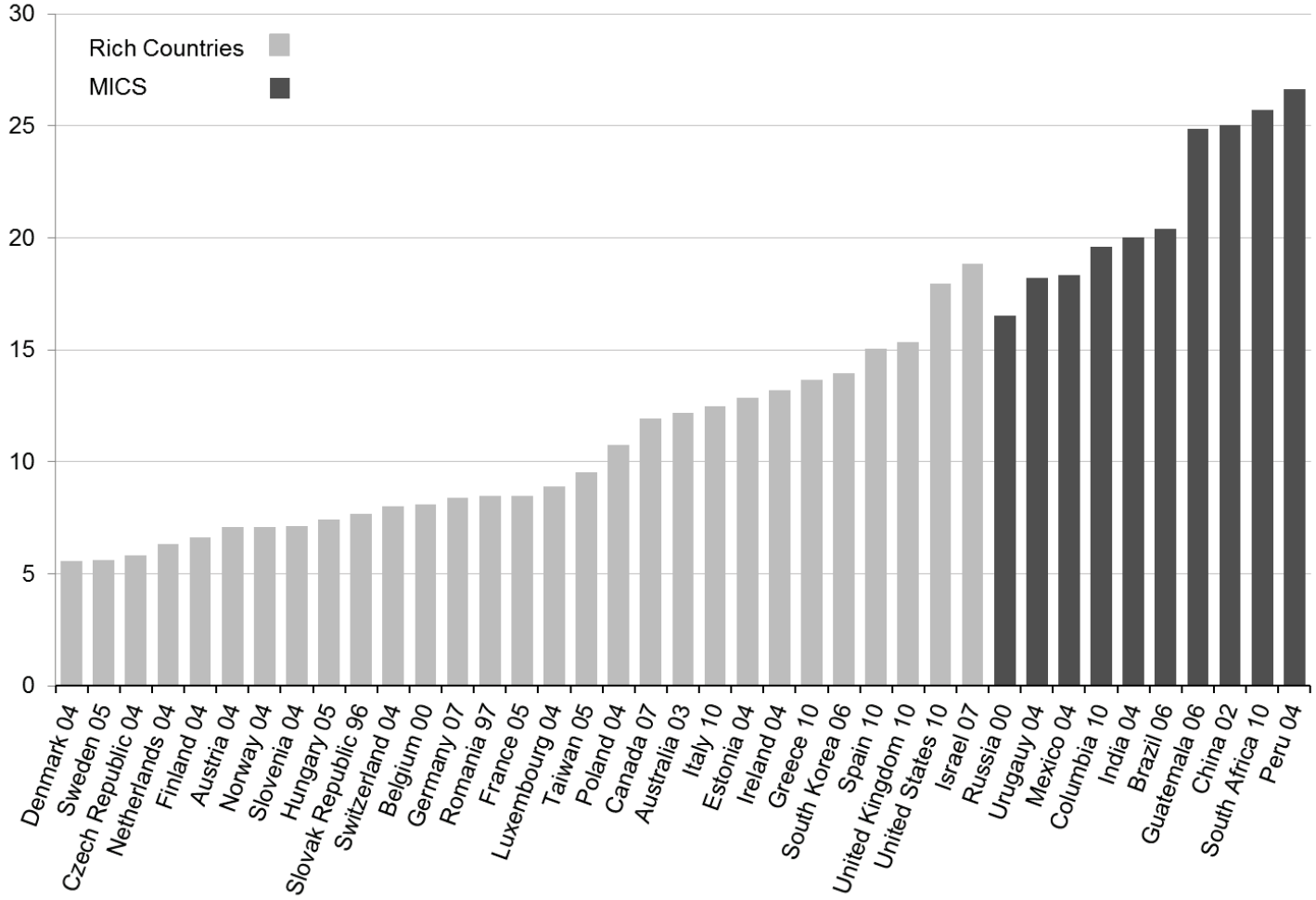
---

[14]A pragmatic reason for not using the poverty gap, especially in cross-national studies, is that underreporting of incomes, the definition of incomes, and editing for item non-response may differentially affect the lowest incomes and overstate the poverty gap.

[15]Indeed, we do not use the Eurostat (2012) poverty measures for two reasons. First, both the LIS and OECD measures rely on the same European Union Survey of Low Income and Living Standards (EU-SILC) data for most of the European Union Nations and, second, because the EU-SILC data are very recent, starting only in 2005.

[16]The Eurostat (2005) produces poverty measures for all 27 EU nations now, including some which are not captured in either OECD or LIS data, and measures of poverty depth and severity as well. But their figures are at the 60 percent of poverty level and are not comparable to the half median figures in LIS and OECD.

Figure 2. Relative Poverty Rates for Total Population (mid to late 2000s) Using LIS data



Source: Luxembourg Income Study, Key Figures http://www.lisdatacenter.org/lis-ikf-webapp/app/search-ikf-figures.

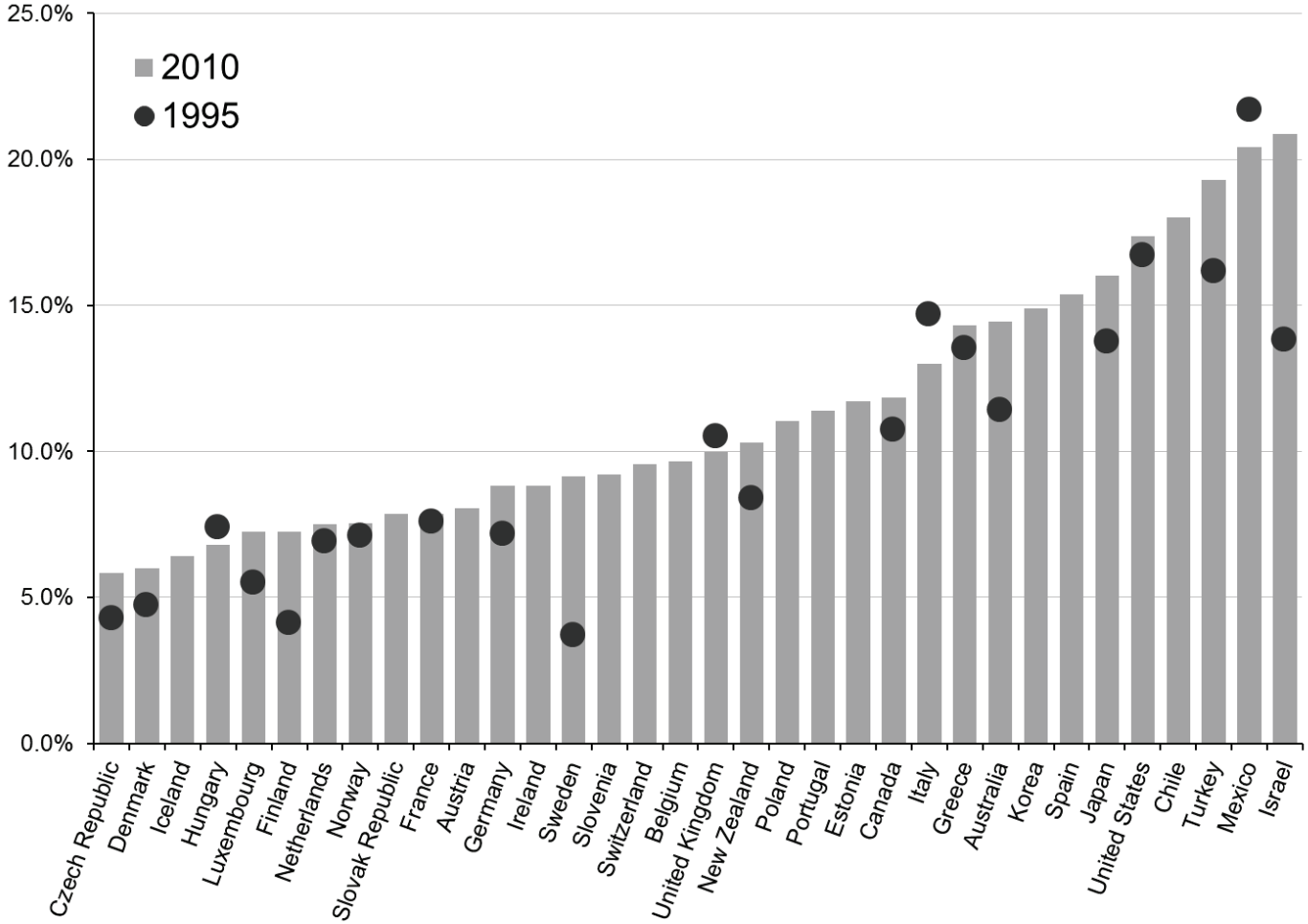
Note: Poverty is measured by the percent of persons living in households with family-size-adjusted income below half the median national income.

If a "less poor" country is one with a "single digit" poverty rate (where between 5 and 10 percent of its population are poor), 17 countries have hit that target in the mid- to late-2000s, as shown in Figure 2. The Scandinavian and Nordic nations are generally lowest, along with a number of "middle" Western, Central, and Eastern European nations who have joined the EU 27, (from Belgium and the Netherlands west to Luxembourg, Germany, France, Austria, plus Switzerland, the Czech Republic, Slovakia, Hungary, Slovenia, and Romania). This pattern has been more or less the same since the first LIS measures appeared 20 to 25 years ago (Smeeding, Rainwater, and O'Higgins, 1990; Atkinson, Rainwater, and Smeeding, 1995), though the number of nations has now expanded considerably. Taiwan weighs in with the 17th lowest poverty rate—about 9.5 percent. Another nine nations have relative poverty rates from 10 to 15 percent, including Italy, Spain, Greece, Poland, Estonia, Canada, Australia, Ireland, and South Korea. Three rich nations are between 15 and 19 percent: the United Kingdom (15), the United States (18), and Israel (19). Moving to the MICs, six countries overlap the three rich nations in the 15 to 20 percent range, with Russia having a poverty rate below the United States and Israel, and Uruguay and Mexico more or less even with the United States. Finally, Colombia, India, and Brazil were all at 20 percent poverty. Poverty rates are 25 percent and above in Guatemala, China, South Africa, and Peru. In short, the range of comparable relative poverty rates from the most comparable source extant varies by a factor of five.

The OECD data in Figure 3 provide essentially the same picture, but with all nations measured in 2010, compared to 2002 to 2010 in Figure 2. The OECD data also adds a few nations (Iceland, Chile, and Turkey) to those in Figure 2 and also presents some data on 15-year trends in poverty, where available. Here Israel leads the league in the table of poverty, with headcount rates surpassing 20 percent. The advantage of the OECD data is its rapidity of observation, and with 15-year trends, it is clear that relative poverty rates may change substantially over short periods of time.

Poverty in LIS is typically somewhat higher among children (Figure 4). Poverty averaged 13.5 percent among the countries for the total population, but 16.5 for children. The correlation between child poverty and poverty in the total population is, however, quite high at .91, as reflected in Figure 4. The

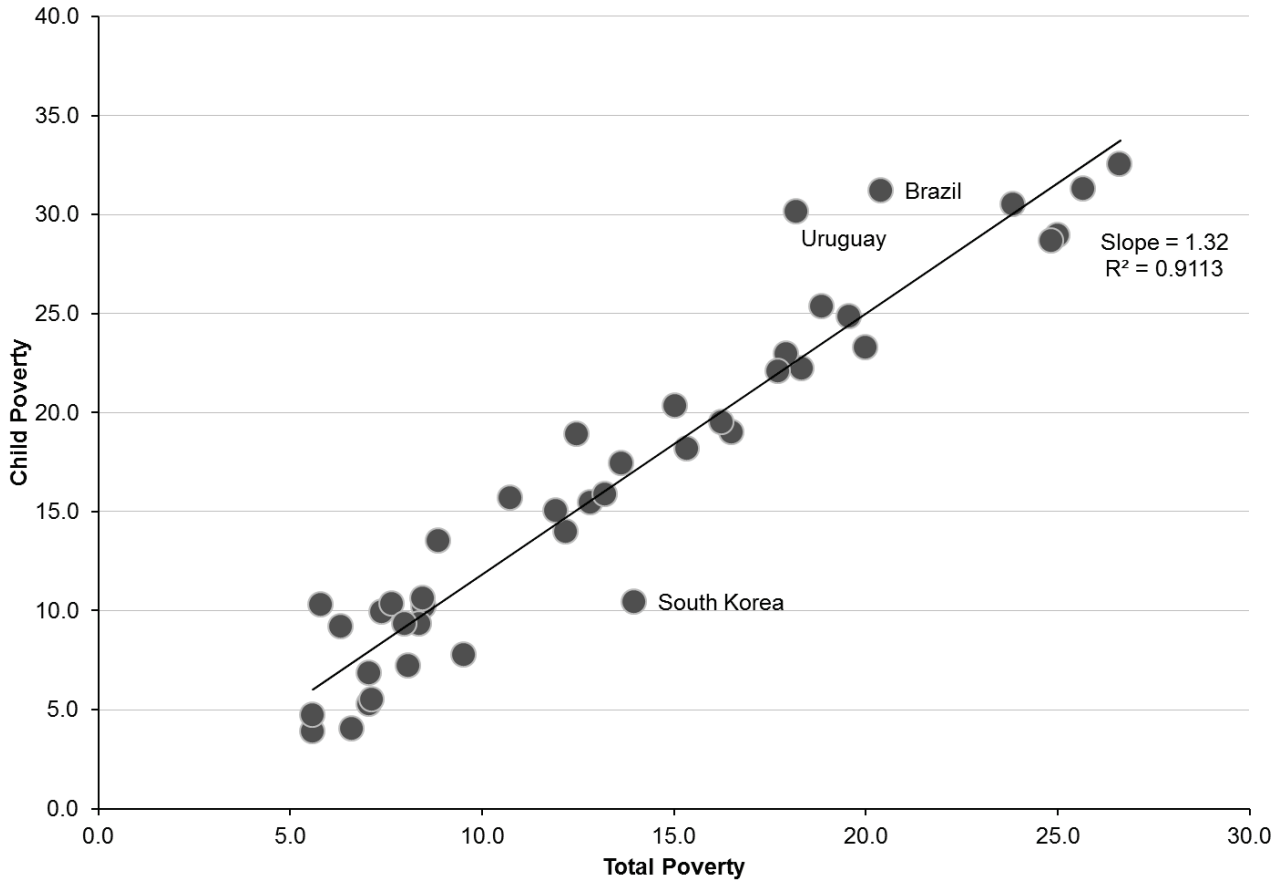
Figure 3. Levels and Trends in Relative Poverty in OECD Nations: 1995–2010



Source: OECD Income Distribution Database (via www.oecd.org/social/income-distribution-database.htm).

Note: Poverty is measured by the percent of persons living in households with family-size-adjusted income below half the median national income.

Figure 4. Correlation between Total Population Poverty (horizontal) and Child Poverty (vertical) in 38 Rich and Middle-Income Countries (Late 2000s, using LIS data)



Source: Luxembourg Income Study, Key Figures http://www.lisdatacenter.org/lis-ikf-webapp/app/search-ikf-figures

Note: Poverty is measured by the percent of persons living in households with family-size-adjusted income below half the median national income.

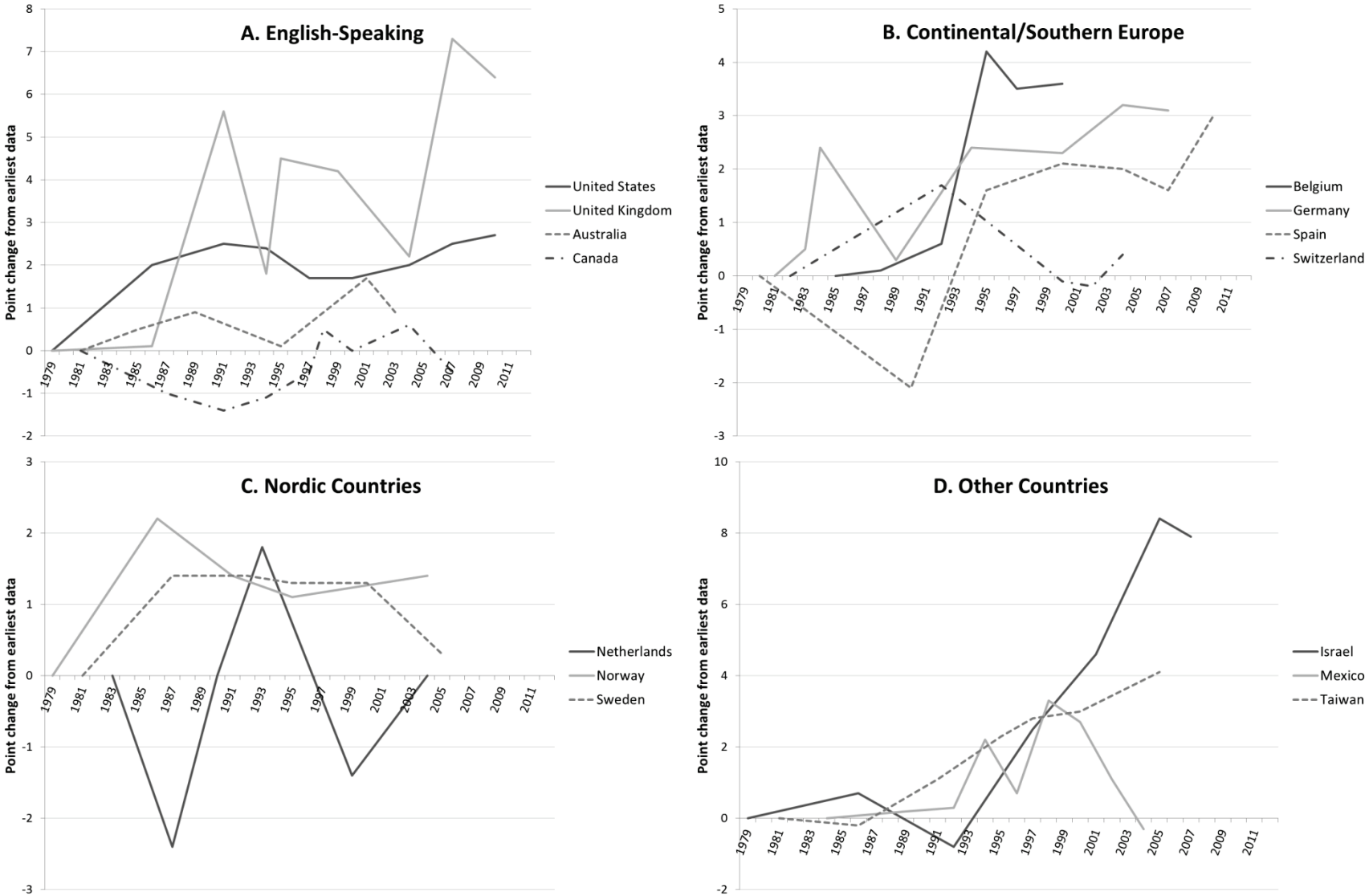
slope of the regression line in Figure 4 is 1.32 suggesting that child poverty rises about 1/3 faster than does overall poverty in these nations. The same sets of countries that are "high," "middle," and "low" poverty countries in Figures 2 and 3 also fall in the same relative positions for child poverty, but in some nations, like Uruguay and Brazil, child poverty is disproportionately higher than overall poverty. In South Korea, child poverty is substantially lower than overall poverty. In the others, child poverty and overall poverty track each other closely. In general, poverty among the elderly is both lower and falling compared to that among children, which is higher and rising in most nations (LIS key figures, and OECD, 2013, Figure 8).

Trends in poverty can be evaluated using the same data, and allow us to break the countries into several different groups based the range of years over which data are available and geographic/institutional comparability. The panels in Figure 5 show longer-term (since 1979) trends for the 14 different countries that have been in the LIS data for the longest period. All of these figures include data up through 2010 (or the latest year available). The trends from 1995 to 2010 are best illustrated using the OECD data in Figure 3 where we have such data for 21 nations.

In analyzing trends in poverty, we are interested in both the direction of change and its magnitude. One finding is that none of the countries in Figure 5 (those countries with the longest series of data) have poverty that is appreciably (3 percentage points) lower in the most recent year than in the initial year of data from the late 1970s or early 1980s.[17] Canada (Panel A) and Mexico (Panel D) do have a bit lower poverty, but the difference for each country is very small (-0.5 and -0.3 points respectively, with both series extending up through the mid-2000s—2007 and 2004, respectively). The trend data from the OECD (1995 to 2010 in Figure 3) suggest that relative poverty fell only in Italy and Mexico over that period, but both by less than 3 percentage points.

[17]Appreciably here means a more-than 3 percentage point change. Atkinson et al. (2012) discuss the definition of a salient change in the poverty percentage, explaining that there are both supply (sampling error and other design elements) and demand considerations (use of the figures). They end up applying a 2 percentage point change criterion. The period examined here is a much longer one, so we choose 3 percentage points as the cutoff. The lines in Figure 5 show the 3 percentage point bounds in each panel.

Figure 5. Trends in Half-Median Poverty for 14 Rich/Middle-Income Nations: 1979–2010



Note: Poverty is measured by the percent of persons living in households with family-size-adjusted income below half the median national income.

Each of the other countries with long-trends in Figure 5 has seen poverty rise or remain flat. Two countries stand out for particularly large increases, including Israel (Panel D) and the United Kingdom (Panel A), while the Nordic countries stand out as a cluster for seeing very little change in poverty (Panel C) in the LIS data. In contrast, the OECD data in Figure 3 shows a massive increase in Swedish poverty, coming mostly after 2005 (compare to LIS trend for Sweden in Figure 5, Panel C) and almost no change from 1995 to 2010 in the United Kingdom.[18] While relative poverty more than doubled in Sweden, appreciable increases can also be found in Australia, Finland, Israel, and Turkey, over the 1995 to 2010 period (Figure 3).

Returning to Figure 5, in some nations, such as the Netherlands and Spain, poverty fell in the 1980s but returned to former levels (Netherlands) or went on to new heights (Spain) in the LIS data. Poverty in Mexico rose though 1997, but then plummeted back to near its origin in 2004. Israel and the United Kingdom each had poverty rates more than 6 points above their origins by the late 2000s. Poverty rose steadily in the United States and Germany, increasing by about 3 percentage points in each, and by 4 points in Taiwan and more than 3 points in Belgium from origin until the late 2000s. The rest generally stayed within plus and minus 3 percentage point bands from the origin until final year.

While lessons can be drawn about the importance of the start and end dates in term of volatility, as well as differences across data sources in Figures 3 and 4, some lessons emerge. These trends suggest that progress against relative poverty was uneven and rare in rich nations over the past 20 to 30 years. Other than Mexico, poverty rates were not consistently falling over the past 25 years in any of the nations we examine here.[19]

---

[18]Interestingly, the rise in Swedish relative poverty coincides with a rapid increase in income inequality, see next section. Because Sweden is one of the few nations which use register data that contain the full range of top incomes, the rapid rise in the Swedish median income may be in part driving this trend.

[19]Ferreira de Souza (2012) also suggests that both poverty and inequality are falling in Brazil over the 1995–2009 period.

3E. Relative versus Anchored Poverty and the Great Recession

A different way to examine progress against poverty is to take a set of OECD nations and examine changes in both relative and anchored poverty in 12 nations over an 8- to 15-year period using LIS (Table 1) or across the shorter period of the Great Recession (GR), from 2005 or 2007 to 2010 (Figure 6). On average, relative poverty did not change much in LIS, but anchored poverty fell by about a third from 11.7 to 8.0 percent between the mid-1990s and the year of the most recent observation (Table 1), suggesting rising living standards for people with incomes that would have been considered poor in the initial period. Indeed, anchored poverty fell in every nation, reflecting rising living standards in Europe and elsewhere in the rich and MIC world, up until the Great Recession. In contrast, the changes in relative poverty over this same period were small on average in the LIS data but ranged from an increase of 4.6 percentage points in the United Kingdom to a fall of 2.5 percentage points in Hungary and Mexico. All other relative poverty rates changed by less than 2 percentage points over this period.

The effects of the Great Recession (GR) are included in the four LIS datasets in bold for the United States, United Kingdom, Italy, and Greece in Table 1. In each nation a data point is also available for 2007 (or 2008, for Italy only). In each nation, relative poverty rose by .2 to 2.2 percentage points through 2010, suggesting greater relative income losses for the poor than the rich in each nation during the GR. And despite the overall trends in each nation, anchored poverty rose between 2007/08 and 2010. It increased by 1.2 points in the United States, 1.9 points in Italy, 2.6 points in Greece, and by 3.0 percentage points in the United Kingdom. Hence, in each nation, despite the overall reductions in anchored poverty shown in Table 1, the poor lost ground in both relative and real terms over the course of the GR.

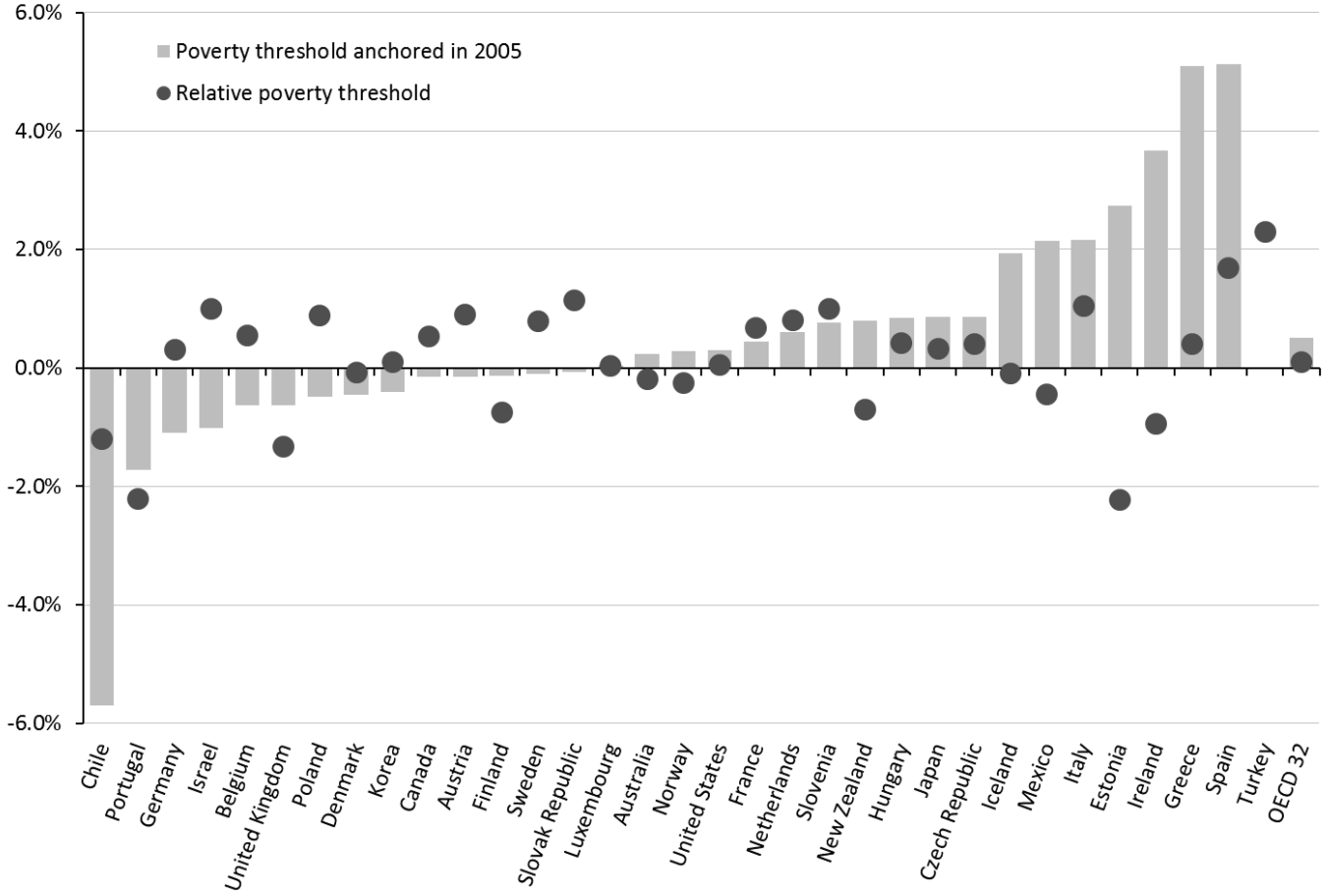
The OECD data (Figure 6) suggest much the same pattern in these four nations, but add many others as well. Iceland, Mexico, Spain, Estonia, and Ireland join the list above, where living standards fell during the GR and anchored poverty rose much faster than relative poverty. Indeed, relative poverty did not increase much at all during the GR (and even fell in Estonia and Ireland). In Poland, Belgium, and

Table 1. Trends in Relative and Anchored Poverty

		Poverty Rates				
		Initial Year	End Year		Percentage Point Change from Initial Year	
	Years	Relative	Relative	Anchored	Relative	Anchored
Czech Republic	1996–2004	5.1	5.8	3.4	0.7	-1.7
Germany	1994–2007	7.7	8.4	7.3	0.7	-0.4
France	1994–2005	8.0	8.5	7.2	0.5	-0.8
Netherlands	1993–2004	8.1	6.3	4.4	-1.8	–3.7
Hungary	1994–2005	9.9	7.4	4.8	-2.5	-5.1
United Kingdom	**1994–2010**	**10.8**	**15.4**	**7.2**	**4.6**	**-3.6**
Canada	1994–2007	11.3	11.9	7.6	0.6	-3.7
Australia	1995–2003	11.4	12.2	7.8	0.8	-3.6
Italy	**1995–2010**	**14.1**	**12.5**	**9.5**	**-1.6**	**-4.6**
Greece	**1995–2010**	**15.4**	**13.6**	**6.4**	**-1.8**	**-9.0**
United States	**1994–2010**	**17.6**	**17.9**	**14.5**	**0.3**	**-3.1**
Mexico	1994–2004	20.8	18.3	16.5	-2.5	-4.3
Average		11.7	11.5	8.0	-0.2	-3.6

Source: Author's calculations with LIS micro data files, http://www.lisdatacenter.org/.
Note: Poverty is measured by the percent of persons living in households with family-size-adjusted income below half the median national income.

Figure 6. Anchored Poverty in OECD Countries: 2007–2010



Source: OECD Income Distribution Database (via www.oecd.org/social/income-distribution-database.htm).

Germany, anchored poverty fell but relative poverty did not change much. In Portugal and Chile, both anchored and relative poverty fell during the GR. The changes in other nations were smaller.

We conclude that there was little progress in reducing relative poverty in almost all the rich nations examined here over the past two or three decades. Anchored poverty did decline in almost all rich nations from the 1990s up until the Great Recession in 2007. But since the onset of the GR, anchored poverty trends have been upward, with increases in anchored poverty in a majority of nations reducing some of the progress in real living standards for low-income households over the past 20 years, especially in the nations hardest hit by the GR. Relative poverty rates changed much less during the GR.

Finally we present a chart showing the correlation between relative poverty and inequality (using the LIS project Gini Coefficient for Disposable Household Income) across 38 nations in Figure 7. The correlation is astoundingly high, at over 91 percent. And the slope is .63 suggesting that a 10 point difference in the Gini, say from .20 to .30, is associated with a more than 6 percentage point increase in relative poverty. Still, at inequality levels of about .27 and .32, poverty rates can vary as much as 4 percentage points across nations with the same level of overall inequality. Four nations stand out as having above average poverty for their inequality level: Guatemala, Israel, South Korea, and the United States. Relative poverty levels are notably lower than inequality in the Czech Republic, Netherlands, Austria, and Hungary.

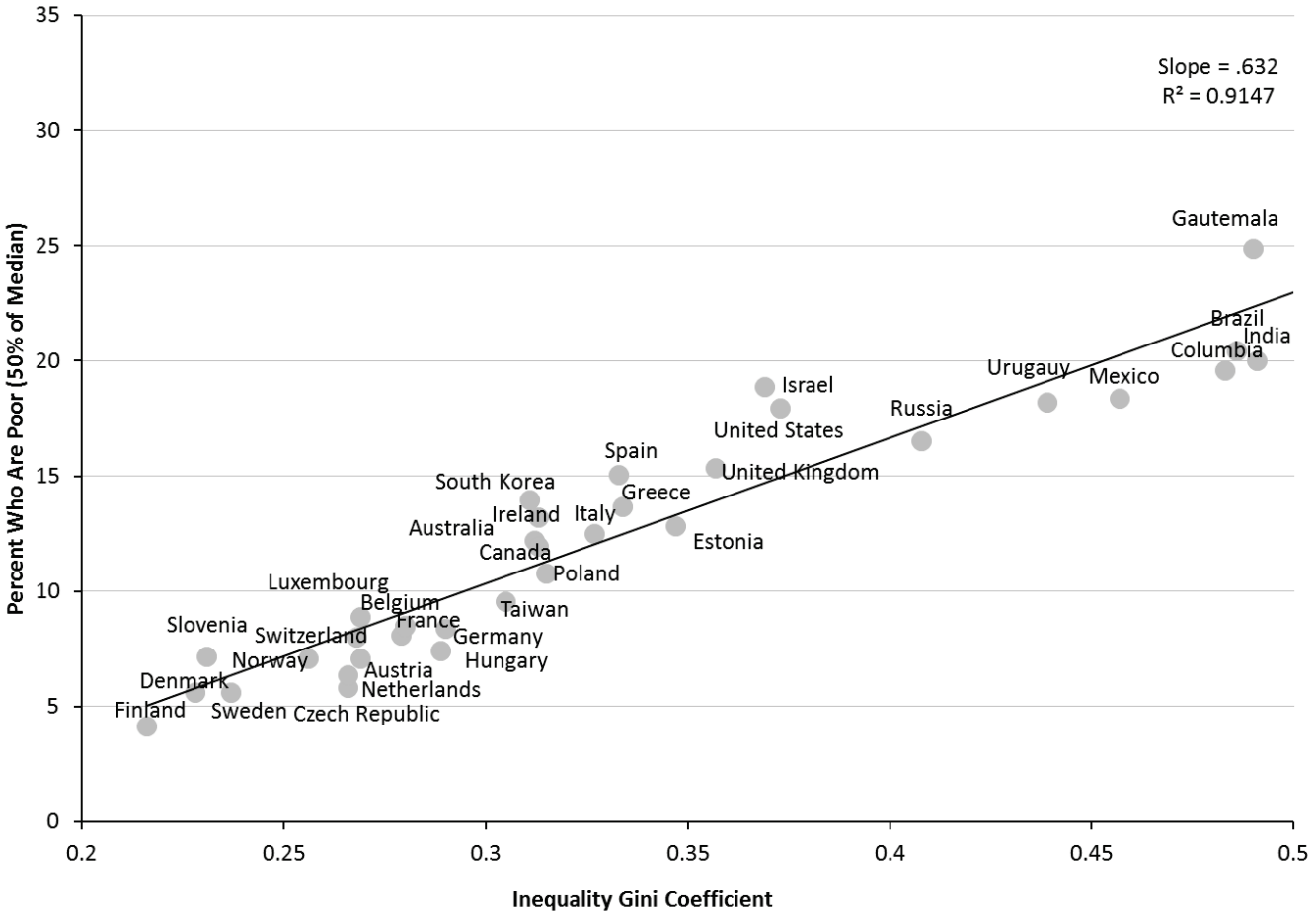
4. INEQUALITY IN INCOME

4A. Measures of Inequality from the Overall Distribution

4A.i. Introduction

This section focuses on measures of the overall distribution of income in high-income and some middle-income and developing countries. In contrast with the next section, which focuses narrowly on the top of the pre-tax income distribution, this section considers a variety of statistics that either explicitly exclude the very top (and bottom) of the distribution, or that use the full distribution, but are calculated with data that are not necessarily representative of incomes at the very top. Most of this section describes

Figure 7. Relationship of Relative Poverty and Income Inequality in 38 Nations (LIS)



Source: Luxembourg Income Study, Key Figures http://www.lisdatacenter.org/lis-ikf-webapp/app/search-ikf-figures.

trends since 1970, but some attention is also paid to data series that are available over shorter periods, and to single-year analysis of the most current available income data, which allow us to discuss a broader range of inequality metrics and a greater number of countries.

Overall conclusions about the broad distribution of household income include:

- The countries with the least unequal distributions are the Nordic (Sweden, Norway, Denmark, and Finland) and "Benelux" (Belgium, Netherlands, and Luxembourg) countries as well as Austria and some Eastern European nations.
- Across middle- and high-income countries there is a wide range in levels of inequality. By most measures the income distribution in the United States is among the most unequal, and when compared to the narrower set of the richest nations, the distribution in the U.S. is the most unequal. A number of middle-income and developing nations, including Brazil, China, Turkey, and South Africa, though, have distributions of income that are more unequal than in the United States.
- Taxes and transfers reduce the degree of inequality in every country, but there is dramatic variation in the extent of redistribution. The impact of taxes and transfers is very small in some highly unequal countries (Russia) and some less unequal ones (South Korea). In some countries, taxes and transfers have a dramatic impact on the distribution of income; Finland has among the most unequal distributions of market income, but one of the most equal distributions of Disposable Household Income (DHI) due to the extensive distribution in its welfare state. The United States combines relatively high levels of inequality in market income with very low levels of tax and transfer redistribution to achieve the highest level of DHI inequality among rich nations.
- The distribution of income has become more unequal in most countries since the 1970s. The only rich country to buck the long-term trends toward greater inequality is France. Even France, though, has experienced increases in inequality since the early 2000s.
- The income distribution in a number of countries has followed a "U-shaped" pattern (Sweden, Finland, and Canada), falling in the 1970s or the 1980s before rising in the 1990s.
- Two of the most unequal of the rich nations—the United States and the United Kingdom—experienced large increases in inequality in the late 1970s and 1980s and modest increases in the second half of the 1990s, but in both countries the level of inequality in 2010 is not very different from levels experienced in the early 1990s.
- The distribution of market income in Germany, Italy, Japan, and some of the Nordic countries grew steadily more unequal between the mid-1980s and the mid-2000s, and the distribution of pre-tax/transfer income in those countries is now almost as unequal as in the United States, Israel, or the United Kingdom.
- In almost all countries the long-term trends in inequality are more pronounced among the working-age population.

4A.ii. Distributional Statistics

A variety of statistics have been developed for the analysis of the distribution of income. The most commonly used statistic is the Gini coefficient, but a number of other measures have been applied to a wide range of countries using data covering the most recent decades. The statistics discussed below include Lorenz curves, the Gini coefficient, Atkinson Index, percentile ratios (P90/P50 and P90/P10), quintile shares (S80/S20), and the Palma Index. (See Allison, 1978; Cowell, 2000; and Heshmati, 2004, among others, for overviews of the various summary statistics to describe distributional inequality.)

Not a statistic per se, the Lorenz curve is a graphical representation of the cumulative distribution of income. The Lorenz curve uses ordered income data and shows the cumulative share of income held at each point in the distribution of households.

In order to reduce the information contained in the Lorenz curve to a single number, a variety of summary statistics have been proposed. One that has a direct link to the Lorenz curve is the Gini coefficient. The Gini coefficient can be calculated in a number of ways, and visually can be represented as a ratio of the area between the Lorenz curve and the perfect equality line divided by the total area below the perfect equality line. In ordered data for household share of total income, the 45-degree line represents perfect equality; each household has the same income and each point in the distribution of total households matches the same point in the distribution of total household income (e.g., the bottom 45 percent of households receive 45 percent of total income). The Gini coefficient ranges from zero to one, with zero representing perfect equality and one the most extreme inequality if all income is held by a single household.

Using unordered data, the Gini coefficient for household income can be calculated as the "relative mean difference," or the average absolute difference between incomes for all pairs of households divided by twice the mean income (Allison, 1978):

$$GINI = \frac{\sum_{i=1}^{N} \sum_{j=1}^{N} |x_i - x_j|}{2N^2 \bar{x}} \quad (1)$$

In (1) "N" represents the total number of households, "i" and "j" index each household in all possible pairings of household, "x" is household income, and "$\bar{x}$" is mean income over the sample.

The Gini coefficient is one of many statistics representing the entire distribution. Other commonly used measures of inequality focus on specific points or regions of the distribution. Below we discuss inequality measures from the most recently available data using the P90/P10 and P90/P50 inter-decile ratios, which represent "high" income levels (from the 90th percentile of the distribution in this case) as some multiple of "low" income (the 10th percentile of the distribution) or "middle" income (the median). A similar measure, the S80/S20, represents a ratio of the shares of total household income received by those in the top quintile of the distribution and those in the bottom quintile. The Palma Index, popularized by Palma (2011), is a slight modification of the more common S80/S20 and divides the share of income held by the highest ten percent of the distribution by the share of income received by the lowest-income 40 percent of the distribution.

The final measure discussed in this section is the Atkinson Index (ATK).[20] Similar to the Gini coefficient, the ATK summarizes the entire distribution. Unlike the Gini, though, the ATK can be decomposed to identify different groups or income sources making different contributions to inequality. The Atkinson Index (ATK) differs from the previous measures by explicitly incorporating a weighting variable that can be selected to place more weight on incomes at the top or the bottom of the distribution.

$$ATK(\varepsilon) = 1 - \frac{1}{\bar{x}}\left(\frac{1}{N}\sum_{i=1}^{N} x_i^{1-\varepsilon}\right)^{\frac{1}{(1-\varepsilon)}} \quad (2)$$

[20]The Mean Log Deviation (MLD) is another statistic which uses the entire distribution, but tends to produce results very similar to the Gini coefficient. MLD statistics are not included here for space, they have been calculated by the OECD in the past, including in Divided We Stand (2011). Also, the Squared Coefficient of Variation (SCV) has been used in some analysis of income distribution, including OECD (2011), but rankings developed using this measure have been shown to be very sensitive. Deding and Schmidt (2002) showed that, compared to the Gini Coefficient, the SCV produces substantially larger year-to-year shifts in inequality, and is particularly sensitive to tax and transfer payments at the upper tail of the distribution. For these reasons we do not include SCV measures in this review.

The weighting variable (ε) is typically selected from values between zero and two, although any positive value can be used. Higher values for the weight, called a measure of inequality aversion, reflect greater sensitivity to incomes at the lower end of the distribution. The ATK falls between zero and one, equaling zero under perfect equality and with higher values when dispersion is greater.

4A.iii. Levels of Inequality in High and Middle-Income Countries in the Late 2000s

With expanded interest in the distribution of income, there is more data available from recent years to compare incomes across countries than at any point in history. This section reviews evidence from a broad array of rich and middle-income countries using all of the distribution statistics described above. The following section focuses on a narrower set of countries and examines trends in the distribution of income using a more limited set of statistics. All of the analysis in these sections relies heavily on the data produced and made available by LIS, EUROSTAT, the OECD, and the national statistical agencies of a handful of rich countries.

4A.iii.a. Lorenz Curves

Unlike most summary statistics used in the analysis of inequality, Lorenz curves visually represent the entire distribution. Analyzing these plotted cumulative distribution functions allows us to see if pairs of countries can be ranked by standard dominance criteria.[21] Figure 8 includes a series of Lorenz curves for different geographically or institutionally coherent clusters of countries. Each sub-figure also includes the Lorenz curve for the United States, to aid comparability across the different sub-figures. The figure uses data from the most recent LIS Wave for each country (identified in the sub-figure) and represents equivalized disposable household income.[22]

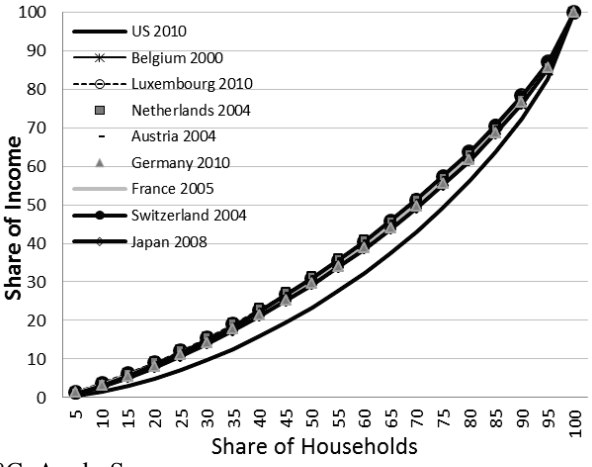
---

[21]See Cowell, 2000, HID, Ch. 1 for a discussion of the properties of Lorenz curves and dominance criteria.

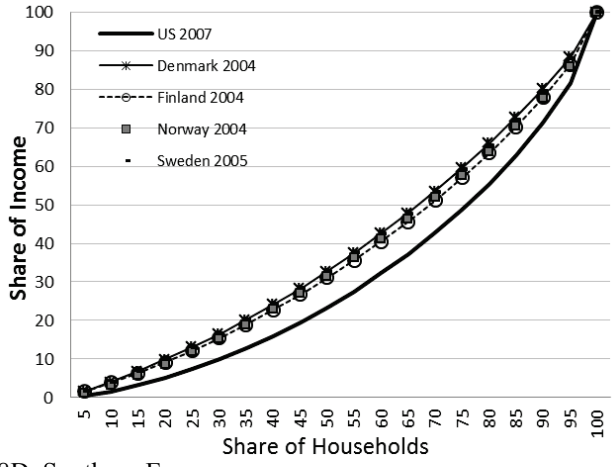
[22]The Lorenz curves displayed here are based on income that is bottom-coded at 1 percent of average income and top coded at ten times median household income.

Figure 8. Lorenz Curves – Mid and Late 2000s of Equivalized DHI (LIS)

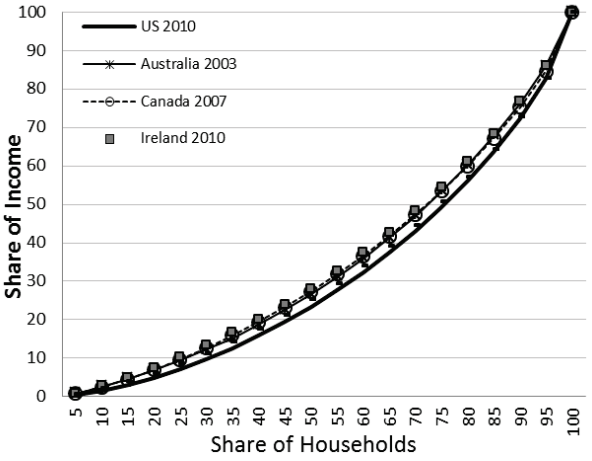
8A. Continental Europe (and Japan)



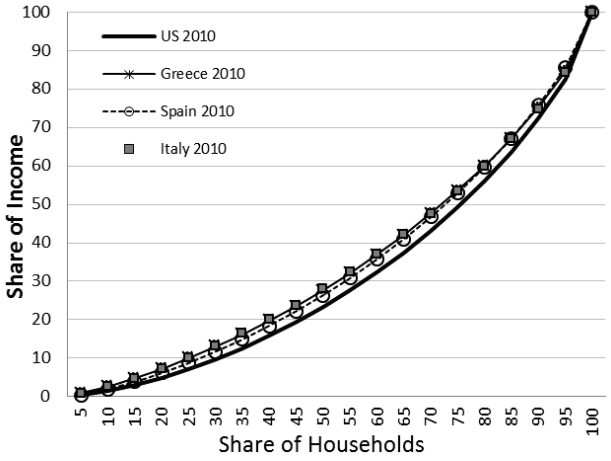
8B. Nordic



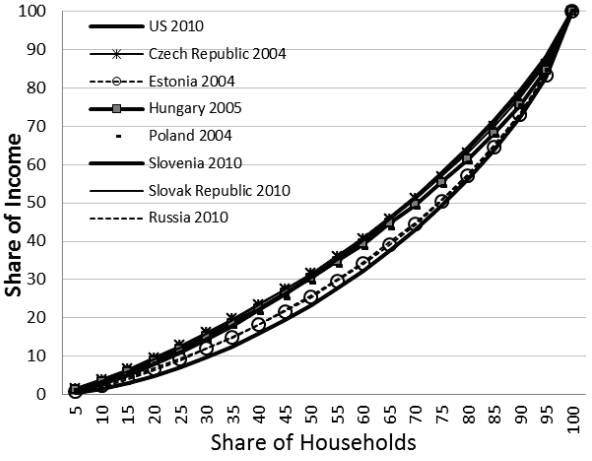
8C. Anglo Saxon



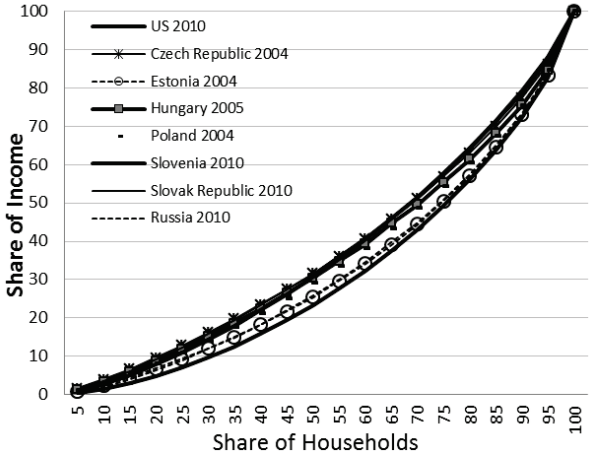
8D. Southern Europe



D. Eastern Europe



E. Other Countries



Source: Authors' Analysis of LIS data.

The distribution of income in the Continental European (and Japan) countries (including Austria, Belgium, France, Germany, Luxembourg, and Switzerland shown in Figure 8A) and the Nordic countries (Denmark, Finland, Norway, and Sweden shown in Figure 8B) is much less unequal than in the United States. Since the Lorenz curves do not cross at any point, we can say that each of these countries has a "superior" Lorenz curve to the United States. Any differences between these countries, slightly more evident among the Nordic counties, are small compared to their differences with the United States.

The U.S. distribution is more unequal than most of the rest of the European countries, but not to such a great extent. In the case of the Anglo Saxon countries (Figure 8C) Australia, Canada, and Ireland have Lorenz curves that are superior to that of the United States, but the Lorenz curves for the United States and the United Kingdom are virtually indistinguishable, although they do not cross. The United States also has an inferior Lorenz curve relative to the countries in Southern Europe (Spain, Italy, and Greece shown in Figure 8D), but the gaps are less dramatic than for the Nordic or Continental European countries. None of the Southern European countries has a distribution that is superior to the others, as the Lorenz curves cross at the top and the bottom of the distributions.

Even in Eastern Europe (Figure 8E), each country has a Lorenz curve superior to that of the United States. In the case of Estonia (2004) and the Russian Federation, the distribution is very similar, especially in the upper third, but at no point do the Lorenz curves cross. In the Slovak Republic, Slovenia, and the Czech Republic (2004) the distributions look more similar to Continental European countries than their Eastern European neighbors.

Only when we expand the set of countries beyond Europe and include "Middle Income" and developing counties, do we find distributions of income that are more unequal than that of the United States ("Other Countries" include South Korea, India, China, Brazil, and Israel in Figure 8F). The most recent LIS data for Brazil, India, China, and South Africa show that the Lorenz curves for those countries are inferior to that of the United States. Among those four nations, South Africa stands out with the most unequal distribution. Israel and the United States have virtually indistinguishable Lorenz curves, both of which are inferior to the Lorenz curves for South Korea and Taiwan.

4A.iv.b. European Union and OECD Country Summary Statistics and Rankings

In recent years the European Union and the OECD have calculated timely summary distributional statistics for their member countries. These figures are based on disposable household income data from 2010–2011 for the European Union, and "around 2010" for the non-EU OECD countries.[23] Statistics from both entities are adjusted for household size using slightly different equivalence scales.

Figure 9 includes three different summary statistics for the 23 richest nations that are European Union or OECD members and is sorted based on rankings for the Gini Coefficient (shown in Figure 9A).[24] With a Gini coefficient of .38, the United States has the highest level of inequality among the rich nations. At the other extreme, with Gini Coefficients between .23 and .28, the Nordic and Benelux (Belgium, Netherlands, and Luxembourg) countries and Austria had the most equal distribution of income, led by Norway. The large continental economies and the Anglo Saxon countries fall in the middle, with Ginis ranging from .28 and .31 in Germany and France, respectively, to between .32 and .33 in Australia, Canada, and the United Kingdom.

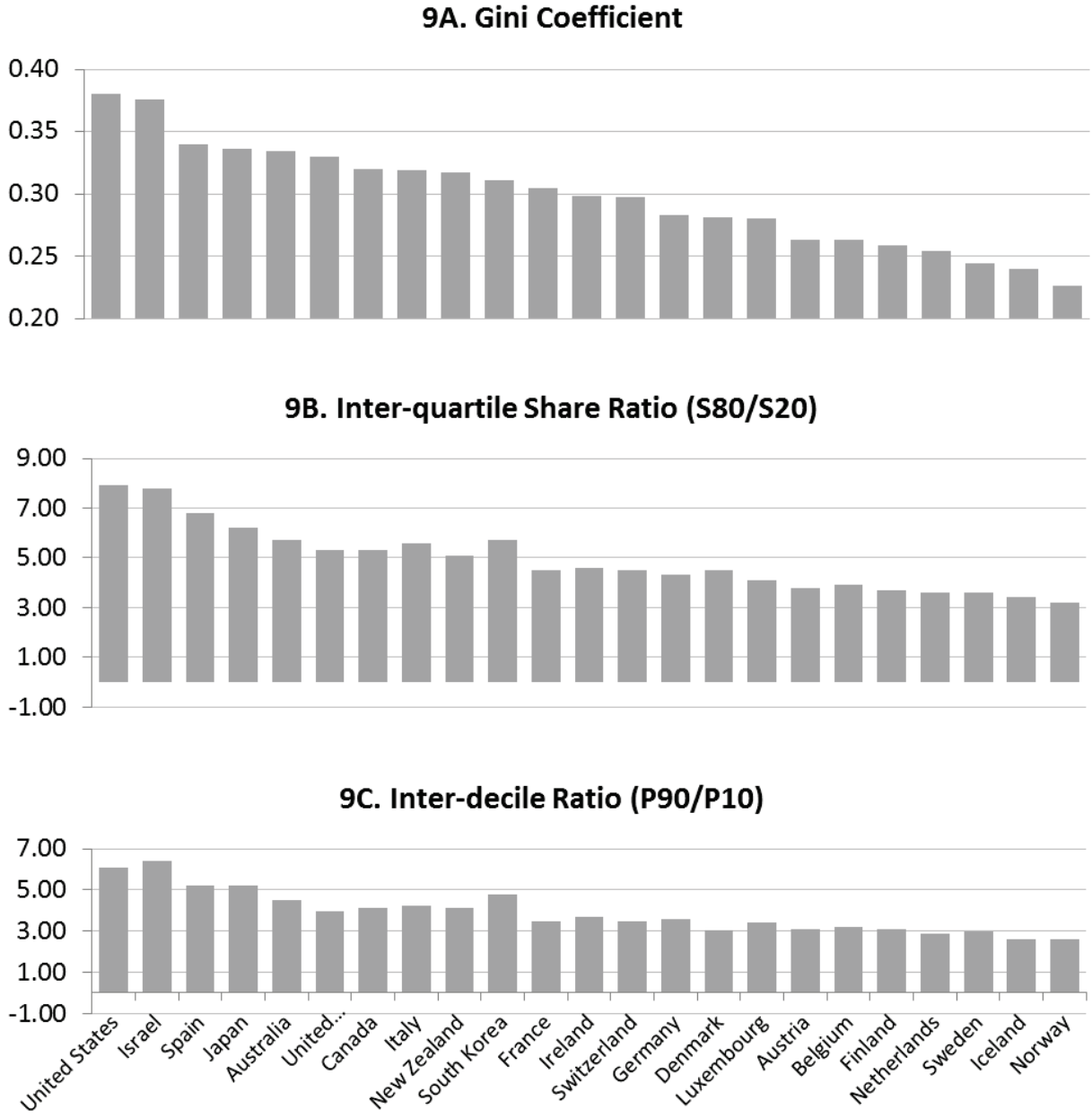
While they are based on smaller ranges of the distribution, the S80/S20 Interquartile Share Ratio (Figure 9B) and the P90/P10 inter-decile Ratio (Figure 9C) each produce rankings similar to that of the Gini coefficient. In the rich nations with the highest S80/S20 ratios, the United States and Israel, the average income among the highest-income fifth of households is 7.8 times the average income in the bottom fifth. In the less unequal Nordic and Benelux nations, the ratio ranged from 3.2 to 3.9. The P90/P10 ratio was 6.4 in Israel, followed closely by the United States at 6.1. Most of the ranking using the P90/P10 is similar to the S80/S20 ranking, and, in turn the Gini coefficient ranking, but the rich Asian nations stand out somewhat. In the Gini Coefficient rankings, Japan and South Korea were similar to, and

---

[23]All figures are reported based on the income year, not the survey year. Eurostat figures are originally published by survey year, but we report them according to the year in which the income was received. Details on the timing for the data are contained in Table 2 and Figure 9.

[24]These nations all have GDP per-capita over $29,000 (PPP) in 2012 and account for 23 of the world's 31 richest countries (International Monetary Fund, 2013).

Figure 9. Summary Distribution Statistics for Equivalized DHI for Richest EU and OECD Nations for 2010–11



Sources: Eurostat and OECD.
Note: EU member country data for mainly from 2011 or 2010; non-EU OECD member country data are primarily from 2010. Gini Coefficient, S80/S20, and P90/P10 ratio figures for EU member countries are based on Eurostat data and are mostly from 2010. A number of EU countries have data from 2011, including: Denmark, Finland, France, Germany, Iceland, Luxembourg, Netherlands, and Norway. Non-EU OECD member county figures for Gini, S80/S20, and P90/P10 are mainly for 2010, with some exceptions: (South Korea, 2011; Japan, New Zealand, and Switzerland, 2009).

somewhat less unequal than many of the Anglo Saxon and Southern European nations. Using the P90/P10, Japan and Korea appear more unequal, and rank third and sixth, at 5.2 and 4.8, respectively. Among the less unequal Nordic and Benelux countries, the P90/P10 lies between 2.6 and 3.2.

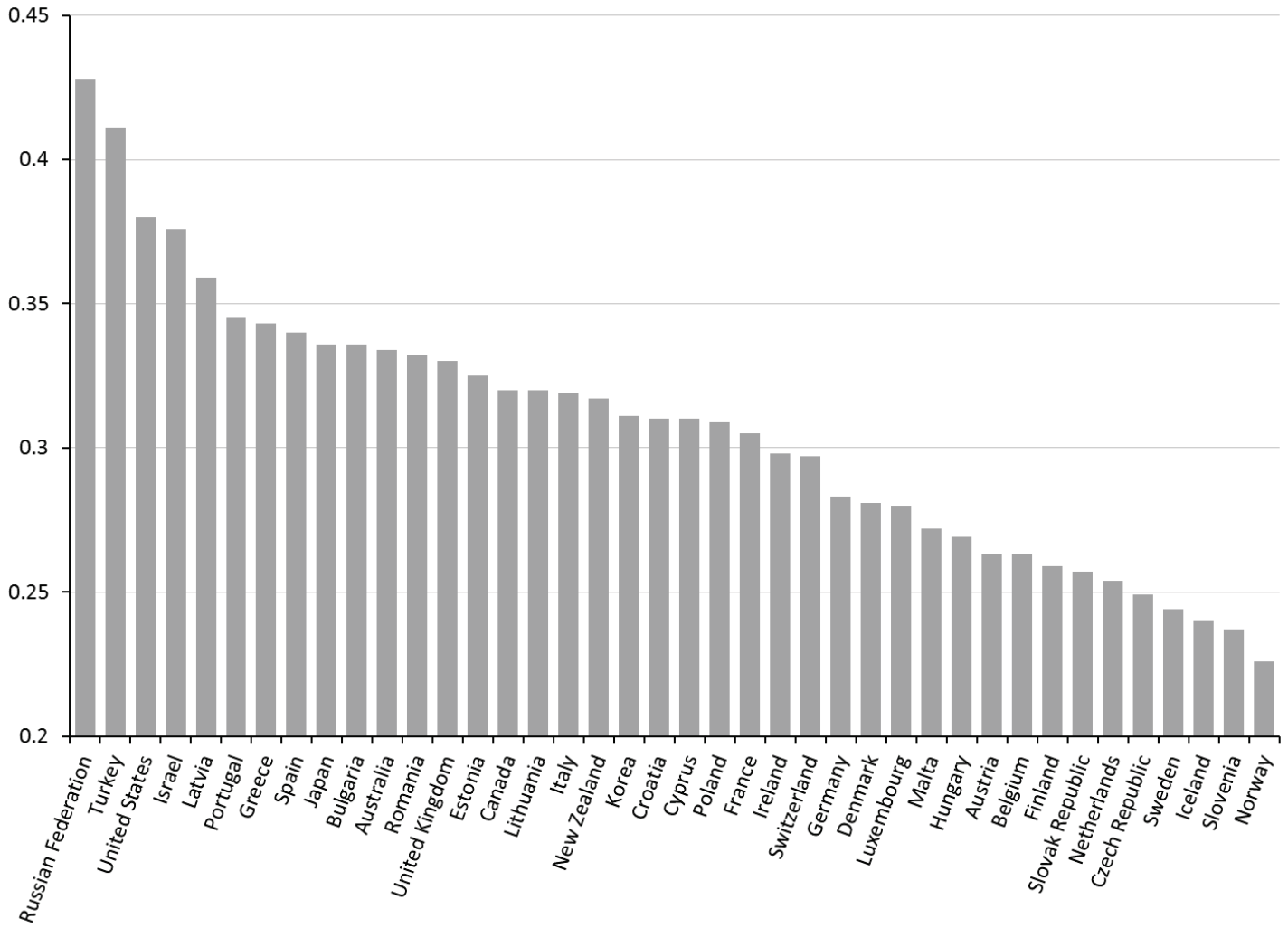
The list of countries regarded as the "most unequal" or "least unequal" is, of course, somewhat dependent on the set of countries included. Figure 10 represents the ordered Gini coefficients for a set of countries that includes the 23 rich nations already shown in Figure 9 with 17 additional "high-income" countries, with GDP per-capita above $12,500 (IMF, 2012), that are also part of European Union or the OECD. In Figure 10, the United States is supplanted by the Russian Federation and Turkey as having the most unequal distributions using the Gini coefficient. The list of countries with less unequal distributions is similarly bolstered as the Nordic and Benelux countries are joined by several Central European nations, including Slovenia and the Czech Republic. All of the summary statistics from Figures 9 and 10 are in included in Table 2.

4A.iii.c. LIS Country Summary Statistics and Rankings

As seen in the Lorenz curves above, the LIS project includes data from a number of countries that are not part of the EU or the OECD. LIS also regularly calculates several distribution statistics not typically reported by the OECD or the EU. Figure 11 includes two different Atkinson Index Measures (ε=0.5, 1), the P90/P50 inter-decile ratio, and the Palma Index (Figure 11D), for 34 countries with values reported in any of the three most recent LIS Waves (covering the decade of the 2000s). The data used in these figures are also included in Table 3.

The alternative summary statistics in Figure 11 maintain the same basic rank ordering among the rich countries shown in Figure 9, with the least unequal distributions found in the Benelux and Nordic countries, and the most unequal found in the United States, Israel, and the United Kingdom. Including the middle-income and developing countries that are part of the LIS project, though, alters the ranking considerably. South Africa stands out as the most unequal country by far among the 34, with an ATK of 0.29, 38 percent higher than second-ranked China. Using a somewhat larger inequality aversion parameter

Figure 10. Gini Coefficient for Equivalized DHI for 2010–11 Including Middle-Income and Developing EU & OECD Nations



Source: European Union EU SILC, Eurostat data (figures for 2010/11 for EU member countries). OECD data are mainly for 2010, exceptions include South Korea, 2011, and New Zealand and Turkey, 2009.

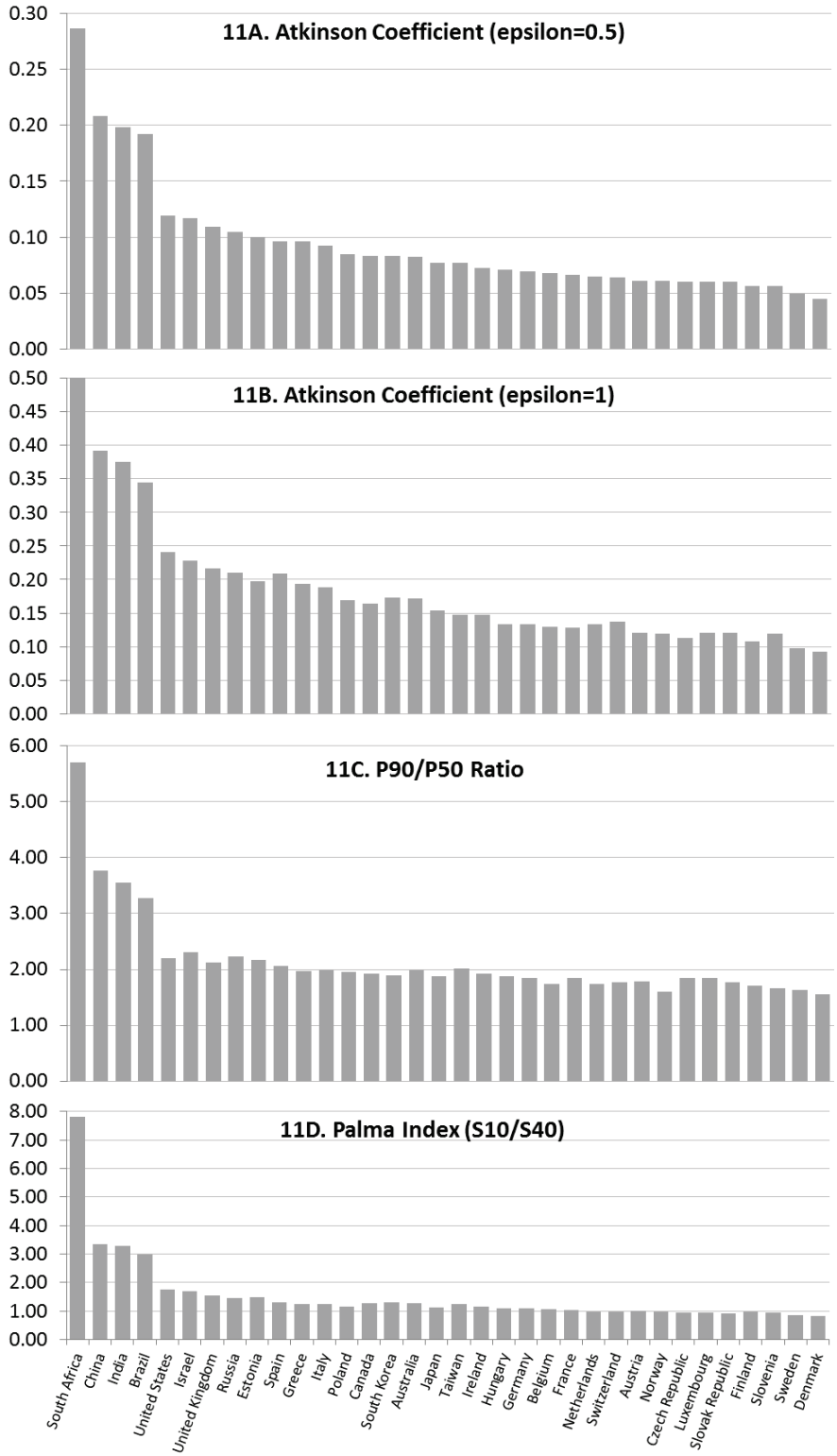
Table 2. Summary Distributional Statistics for Equivalized Disposable Household Income – EU and OECD Measures for 2010–11 and "Late 2000s"

	GINI	Interquintile Share Ratio (S80/S20)	Interdecile Ratio (P90/P10)
Australia	0.334	5.7	4.5
Austria	0.263	3.8	3.1
Belgium	0.263	3.9	3.2
Bulgaria	0.336	6.1	4.9
Canada	0.320	5.3	4.1
Croatia	0.31	5.4	4.5
Cyprus	0.31	4.7	3.7
Czech Republic	0.249	3.5	2.9
Denmark	0.281	4.5	3.0
Estonia	0.325	5.4	4.4
Finland	0.259	3.7	3.1
France	0.305	4.5	3.5
Germany	0.283	4.3	3.6
Greece	0.343	6.6	4.9
Hungary	0.269	4.0	3.3
Iceland	0.240	3.4	2.6
Ireland	0.298	4.6	3.7
Israel	0.376	7.8	6.4
Italy	0.319	5.6	4.2
Japan	0.336	6.2	5.2
Latvia	0.359	6.5	5.1
Lithuania	0.32	5.3	4.4
Luxembourg	0.280	4.1	3.4
Malta	0.272	3.9	3.3
Netherlands	0.254	3.6	2.9
New Zealand	0.317	5.1	4.1
Norway	0.226	3.2	2.6
Poland	0.309	4.9	4.0
Portugal	0.345	5.8	4.6
Romania	0.332	6.2	5.2
Russian Federation	0.428	9	6.9
Slovak Republic	0.257	3.8	3.1
Slovenia	0.237	3.4	3.0
South Korea	0.311	5.7	4.8
Spain	0.340	6.8	5.2
Sweden	0.244	3.6	3.0
Switzerland	0.297	4.5	3.5
Turkey	0.448	11.3	8.5
United Kingdom	0.330	5.3	4.0
United States	0.380	7.9	6.1

Sources: Eurostat and OECD.

Note: Eurostat data is used for EU countries that are also OECD members. EU member country data mainly from 2011 or 2010; non-EU OECD member country data are primarily from 2010. Gini Coefficient, S80/S20, and P90/P10 ratio figures for EU member countries are based on Eurostat data and are mostly from 2010. A number of EU countries have data from 2011, including: Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Luxembourg, Netherlands, Norway, Poland, Portugal, and Slovenia. Non-EU OECD member county figures for Gini, S80/S20, and P90/P10 are mainly for 2010, with some exceptions: (South Korea, 2011; Japan, New Zealand, and Switzerland, 2009; Russian Federation, 2008).
*SCV for all countries is from OECD "Divided We Stand" and are primarily for 2008, except for Hungary and Turkey (2007); Japan (2006). These statistics are no longer collected by the OECD.

Figure 11. Distributional Summary Statistics from LIS Countries Using Equivalized Household Income in 2000s (LIS Waves VI, VII, and VIII)



Note: Sample years range from 2002 to 2010.
Source: Author's analysis of LIS data. (Panels, A, B, and C are from LIS published "key figures." Panel D is based on author's analysis of LIS DATA.

Table 3. Summary Distribution Statistics from LIS using Equivalized Disposable Household Income

	Atkinson Coefficient (epsilon=0.5)	Atkinson Coefficient (epsilon=1)	Percentile Ratio (90/50)	Palma Index (S90/S40)
Australia - 2003	0.082	0.172	1.98	1.28
Austria - 2004	0.061	0.120	1.79	1.00
Belgium - 2000	0.068	0.129	1.74	1.08
Brazil - 2006	0.192	0.345	3.27	3.00
Canada - 2007	0.083	0.164	1.93	1.28
China - 2002	0.208	0.392	3.77	3.33
Czech Republic - 2004	0.060	0.113	1.85	0.96
Denmark - 2004	0.045	0.092	1.56	0.82
Estonia - 2004	0.100	0.197	2.17	1.49
Finland - 2004	0.056	0.108	1.71	0.98
France - 2005	0.066	0.128	1.84	1.04
Germany - 2010	0.069	0.133	1.85	1.10
Greece - 2010	0.096	0.194	1.97	1.26
Hungary - 2005	0.071	0.134	1.87	1.10
India - 2004	0.198	0.375	3.56	3.29
Ireland - 2010	0.072	0.147	1.92	1.14
Israel - 2010	0.117	0.228	2.30	1.69
Italy - 2010	0.092	0.189	1.99	1.26
Japan - 2008	0.077	0.154	1.88	1.13
Luxembourg - 2010	0.060	0.120	1.85	0.96
Netherlands - 2004	0.065	0.133	1.74	0.98
Norway - 2004	0.061	0.119	1.60	0.98
Poland - 2004	0.085	0.169	1.96	1.17
Russia - 2010	0.105	0.210	2.24	1.45
Slovak Republic - 2010	0.060	0.120	1.77	0.93
Slovenia - 2010	0.056	0.119	1.66	0.95
South Africa - 2010	0.287	0.505	5.70	7.81
South Korea	0.083	0.173	1.895	1.31
Spain - 2010	0.096	0.209	2.06	1.32
Sweden - 2005	0.049	0.097	1.63	0.85
Switzerland - 2004	0.064	0.137	1.76	0.97
Taiwan - 2005	0.077	0.147	2.02	1.26
United Kingdom - 2010	0.109	0.216	2.13	1.56
United States - 2010	0.119	0.241	2.19	1.75

Source: Author's analysis of LIS project data. Palma Index is calculated by authors using LIS project data, Atkinson Coefficient and P90/P50 from LIS published "key figures."

(ε=1) results in higher measured ATK index numbers, but by and large preserves the rank ordering across nations (Figure 11A). With greater sensitivity to incomes at the bottom of the distribution, the Czech Republic's rank (from most unequal to least unequal) falls three spots, and Switzerland's rises five spots, but overall, our understanding of which countries have more- or less-equal distributions of income is essentially unchanged by modest changes in the inequality aversion parameter.

Analysis of the P90/P50 inter-decile ratio (Figure 11C) demonstrates the dramatic differences in the distributions of the rich EU and OECD countries from those in the middle-income and developing countries in the LIS project. Israel is the rich nation with the highest P90/P50, with equivalized DHI at the 90^{th} percentile 2.3 times that at the median. Four LIS lower-income countries (Brazil, China, India, and South Africa) have P90/P50 ratios at least 40 percent higher than Israel.

Proponents of adopting the Palma Index have argued that it isolates the portions of the income distribution that are most volatile over time and across countries (Cobham and Sumner, 2013). Compared to the Gini Index (and the ATK) the Palma Index is also transparent as to which portions of the distribution are determining the measure of inequality. This feature is shared by the P90/P10, P90/P50, and S80/S20 measure. Country rankings based on the Palma Index, calculated using LIS data, are very similar to those obtained using more common measures. The Nordic countries have the least unequal distributions, with values ranging from 0.98 (Norway) to 0.82 (Denmark), while South Africa has the most unequal, with a Palma of 7.8. The United States has the highest Palma Index (1.75) among rich nations.

Figure 11 indicates that the country rankings are similar across all four inequality measures. South Africa is the most unequal among the 34 nations in the LIS data using all of the measures, while Denmark is the least unequal. The United States ranks fifth most unequal using three of the measures, and seventh most unequal using the other (P90/P50).

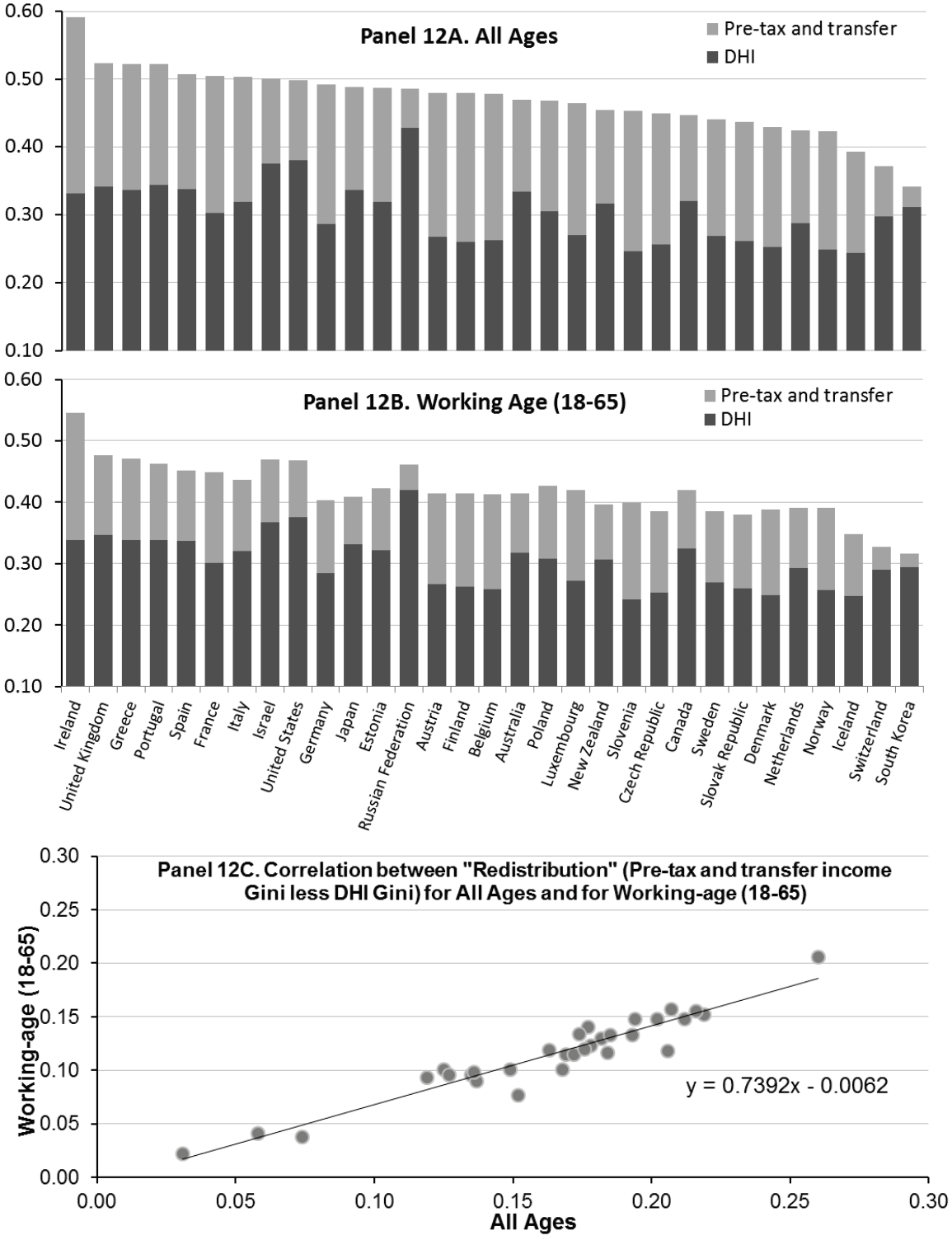
4A.Iii.D. Comparing Current Distributions of Pre-Tax and Transfer Income and Disposable Household Income

In almost every nation, and particularly among rich nations, the tax and transfer systems reduce the disparity of income. Whether taxes are paid at higher rates among upper-income households, benefits and transfer payments are directed disproportionately toward lower-income households, or both, measures of inequality are lower for DHI than for market income. The extent to which the tax and transfer system reduces measured inequality varies substantially across countries. The distributions of DHI and pre-tax and transfer income, and the extent to which taxes and transfers reduce inequality, is shown in Figure 12 for a set of 31 OECD countries. The figure shows Gini Coefficients for DHI and pre-tax and transfer income (sorted on the latter) for all age levels (Panel A) and for working-age (18–65) individuals (Panel B).

The rank ordering of countries based on inequality of pre-tax and transfer income for all ages (Panel A) is very different from the previously described rankings based on DHI. The United States does not have the most unequal distribution of pre-tax and transfer income, even among rich countries, falling ninth behind Ireland, Israel, the United Kingdom, and the Southern European countries. The pre-tax and transfer income Gini for Italy is .50, 47 percent greater than South Korea, which has the lowest Gini among this set of countries. Also, instead of being clustered at the bottom, the Benelux countries are spread across the rankings based on the Gini coefficient for pre-tax and transfer income, and at least one Nordic country—Finland—rises to the middle.

Another important feature highlighted in Figure 12 is the substantial cross-national variation in the extent to which the tax and transfer systems reduce inequality. In several countries—notably the Russian Federation and South Korea—the tax and transfer system has little impact on the distribution of income, and the Gini coefficient for DHI is only slightly smaller than the Gini for pre-tax and transfer income. In the case of Russia, low levels of redistribution leaves the country with very high levels of inequality in DHI compared to other countries. In South Korea there is relatively little redistribution, but

Figure 12. Gini Coefficients Around 2010 for Pre-Tax and Transfer Income and DHI



Note: OECD member country data are primarily from 2010 with some exceptions: (South Korea, 2011; Japan, New Zealand, and Switzerland, 2009; Russian Federation, 2008).

pre-tax and transfer income is distributed more evenly than in most countries, leaving a Gini for DHI that falls in the middle of the rankings.

In other countries, the tax and transfer system has a considerably larger impact on the distribution of income. In eleven countries the Gini coefficient is at least 40 percent lower for DHI than it is for market income. This is true for several of the Nordic and Benelux countries, but also Ireland, Germany, and a number of Eastern European countries as well. Substantial tax and transfer redistribution in these countries leaves them with the most equal distributions of Disposable Household Income. In the case of the United States and Israel, above-average inequality in the distribution of market income combined with below-average levels of tax and transfer redistribution leave them with the highest Gini coefficients for DHI among the rich nations.

In this section we describe the difference between the Gini coefficients for pre-tax and transfer income and DHI as a measure of the extent of redistribution in a country. This measure of redistribution, however, has important limitations and warrants some caveats. One such caveat is that the gap between these two Gini coefficients is a distorted measure of "redistribution" since the tax and transfer policies carrying out said redistribution can be expected to cause some changes in household and firm economic behavior that will be reflected in "pre-tax and transfer" income. Another limitation of this measure of redistribution is that similar types of income are classified as "transfers" in some countries, though not in others, according to different institutional arrangements and policy choices. Retirement income systems are particularly relevant here. Countries with greater reliance on pensions provided directly by the public sector will appear to have greater redistribution than countries that finance retirement schemes through employers and private accounts (supported by tax incentives and potentially regulations).[25] A corollary is that countries with older populations (and otherwise equivalent pension systems) will appear to have greater redistribution by this measure.

---

[25]This will be true even if the level of pension benefits is identical and the level of savings to finance the private pension scheme is equal to the taxes to finance the public pension scheme.

We can compare the extent of redistribution across countries in a way that avoids some of these classification issues, at least in part, by using incomes from the working-age population (Figure 12, Panel B). Excluding retirees, who overwhelmingly rely on pension income, does not dramatically alter the rank ordering of countries based on the Gini coefficient for pre-tax and transfer income or the extent of redistribution observed across countries. The United States and the Anglo Saxon and Southern European countries remain the most unequal, while the Nordic and Benelux countries remain the least unequal. In a few countries, however, the cross-national ranking for inequality of pre-tax and transfer income jumps when elderly individuals are excluded; countries with notable increases include the United States, Canada, Israel, and the Russian Federation.

This extent of redistribution is greater among the total population than it is for the working-age population in every country. In the typical country the measure of redistribution for the working age is almost three quarters as large as it is for the total population (Panel C). The correlation between redistribution for all ages and for the working-age is quite high. The simple correlation coefficient between the measures of redistribution for these two different age groups is .95. Countries that engage in relatively high levels of redistribution among the total population (including the elderly) also tend to engage in relatively high levels of redistribution among the working-age population. Table 4 contains all of the figures used in Figure 12.

4A.iv. Trends in the Distribution of Income Since 1970

Since income distribution data and statistics are only available in recent years for some countries, we are able to analyze trends in the distribution of income since the 1970s for a more limited set of countries than were discussed in the previous section. In this section we first describe trends in the Gini coefficient for equivalized DHI since the mid-1970s for ten rich nations. Then we turn to trends in the S80/S20 and P90/P10 measures, which are available for a somewhat larger number of OECD countries

Table 4. Comparing Household Market Income and Disposable Household Income: Gini Coefficients for OECD Countries around 2010

	All Ages			Working-Age (18–65)		
	Pre-Tax and Transfer Income	DHI	Reduction in Gini Due to Taxes and Transfers	Pre-Tax and Transfer Income	DHI	Reduction in Gini Due to Taxes and Transfers
Australia	0.469	0.334	0.135	0.414	0.318	0.096
Austria	0.479	0.267	0.212	0.414	0.266	0.148
Belgium	0.478	0.262	0.216	0.413	0.258	0.155
Canada	0.447	0.320	0.127	0.420	0.324	0.096
Czech Republic	0.449	0.256	0.193	0.386	0.253	0.133
Denmark	0.429	0.252	0.177	0.388	0.248	0.140
Estonia	0.487	0.319	0.168	0.423	0.322	0.101
Finland	0.479	0.260	0.219	0.415	0.263	0.152
France	0.505	0.303	0.202	0.449	0.301	0.148
Germany	0.492	0.286	0.206	0.403	0.285	0.118
Greece	0.522	0.337	0.185	0.471	0.338	0.133
Iceland	0.393	0.244	0.149	0.348	0.247	0.101
Ireland	0.591	0.331	0.260	0.545	0.339	0.206
Israel	0.501	0.376	0.125	0.469	0.368	0.101
Italy	0.503	0.319	0.184	0.437	0.321	0.116
Japan	0.488	0.336	0.152	0.409	0.332	0.077
Luxembourg	0.464	0.270	0.194	0.420	0.272	0.148
Netherlands	0.424	0.288	0.136	0.391	0.293	0.098
New Zealand	0.454	0.317	0.137	0.396	0.306	0.090
Norway	0.423	0.249	0.174	0.391	0.257	0.134
Poland	0.468	0.305	0.163	0.427	0.308	0.119
Portugal	0.522	0.344	0.178	0.462	0.339	0.123
Russian Federation	0.486	0.428	0.058	0.461	0.420	0.041
Slovak Republic	0.437	0.261	0.176	0.380	0.260	0.120
Slovenia	0.453	0.246	0.207	0.399	0.242	0.157
South Korea	0.342	0.311	0.031	0.316	0.294	0.022
Spain	0.507	0.338	0.169	0.452	0.337	0.115
Sweden	0.441	0.269	0.172	0.385	0.270	0.115
Switzerland	0.372	0.298	0.074	0.328	0.290	0.038
United Kingdom	0.523	0.341	0.182	0.477	0.347	0.130
United States	0.499	0.380	0.119	0.468	0.375	0.093

Source: OECD Inequality Database. Data for most OECD countries is for 2010, exceptions include (South Korea, 2011; Ireland, Japan, New Zealand, and Switzerland, 2009; Russian Federation, 2008). Accessed October 23, 2013.

starting mostly in the mid-1980s, but with data going back to the 1970s for a few.[26] Then we discuss trends in the Gini coefficient for pre-tax and transfer income, and the extent to which taxes and transfers lower the Gini coefficient in a broader range of OECD countries. Finally, we compare trends in inequality since the mid-1980s using all three distributional statistics for working-age population and for all ages.

4A.iv.a. Trends in Equivalized DHI Gini Coefficients for Ten Rich Nations

Most of the rich nations which have collected comparable, mostly annual, data since the early 1970s have experienced sizeable increases in the Gini coefficient (Figure 13).[27] For some countries those increases came in the 1980s (United States, United Kingdom, and the Netherlands), while for others they came in the 1990s and early 2000s (Canada, the Nordic countries, and Germany). Inequality trends in these countries can be thought of as following a "J" or "U" shape to varying degrees (see Gottschalk and Smeeding, 2000, for further discussion).

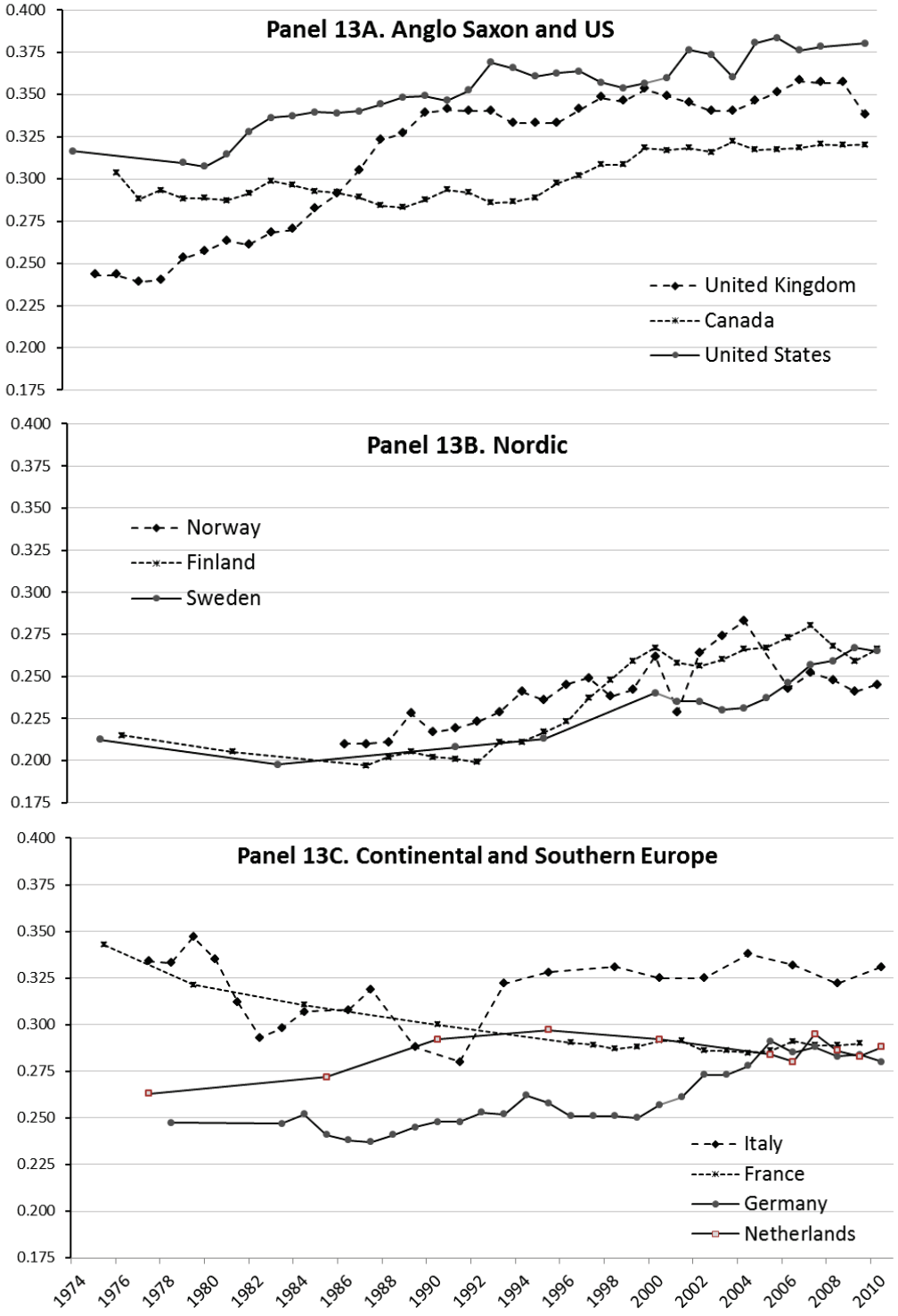
In Italy and France, inequality fell in the 1980s, and since the mid-1990s the Gini coefficient has changed little in either country. Italy's early 1980s declines were, however, offset by increases in the early 1990s (Brandolini and Vecchi, 2011). Most of the rich nations included in Figure 6 have experienced relatively small changes in their DHI inequality over the last ten or twenty years, but many have witnessed marked cyclical fluctuations, particularly the United States, the United Kingdom, and the Nordic countries.

In most cases the rank ordering of countries remains unchanged after nearly forty years of mostly rising inequality. The most dramatic shifts were undertaken by France, which had the most unequal distribution (among these rich nations) in the mid-1970s, and now has a Gini coefficient only modestly

[26]There are 14 OECD countries with S80/S20 and P90/P10 statistics available starting in or before the mid-1980s. For 5 of those countries there are some data for some years in the 1970s. For several of these countries there is a single year of data for these indicators available for the 1970s.

[27]Data for these countries are collected by the OECD (described in their income distribution database) and by national statistical agencies in some countries. Data for the UK, Finland, Norway, France, and Germany are from national statistical agencies and are also published in Atkinson and Morelli (2012, 2014) (updated by the authors), which provides further detail on the sources. Data for Italy was published in Brandolini and Smeeding (2007, 2009) and since updated by Brandolini (personal communication with the authors).

Figure 13. Trends in Equivalized DHI Gini Coefficient in Rich Countries by Country Group, OECD and Statistical Agency Data



Source: OECD income distribution data for Canada, Sweden, and United States. "Inequality Chartbook" (Atkinson and Morelli, 2012 and 2014) based on statistical agency published figures for remaining countries, updated by authors. Data for Italy from Smeeding and Brandolini (2011), updated by Brandolini.

higher than that of the Nordic countries. Also, the United Kingdom had among the least unequal distributions in the mid-1970s and has been among the most unequal since the early 1990s. The United States has had the most unequal distribution of income among rich nations since the early 1980s.

Rising inequality in the Nordic countries has produced relative, but notable shifts as well. Up through the early 1990s, the distribution of income in the Nordic countries was substantially less unequal than other countries; since that time rising inequality in the Nordic countries and stable (France and the Netherlands) or modestly rising (Germany) inequality in other countries has produced some convergence in the inequality levels in Continental Europe and the Nordic countries. In Germany, the Gini of DHI rose 14 percent (from .25 to .28) over the period.[28] While the distribution of income was less unequal in the Lander of the former East Germany (EDHI Gini of .20 in East Germany and .25 in West Germany in 1991), reunification had little impact on the inequality trends for Germany (Grabka and Kuhn, 2012; Fuchs-Schündeln and Schündeln, 2009).

Compared to early 1980s, the range of inequality measures of these ten rich countries has become somewhat more compressed. The two nations that previously had the most equal distributions—Sweden and Finland—experienced some of the largest increases in inequality. Around 1980, this set of ten rich countries had a mean DHI Gini of .265 with a variance of .0022; around 2010 the mean had risen to .30, while the variance had fallen to .0017.

4A.iv.b. Trends in the S80/S20 and P90/P10 Measures for Equivalized DHI for Fourteen OECD Countries

A somewhat larger group of countries has been collecting comparable income data at least since the early 1980s (with Denmark, Israel, Japan, Luxembourg, and New Zealand augmenting the ten rich nations discussed in the previous section).[29] The OECD has analyzed the income surveys from those

[28]For further analysis of trends in German inequality see Grabka and Kuhn (2012), Faik (2012), and Goebel et al. (2010).

[29]France is not included in the OECD series that are available to calculate S80/S20 and P90/P10 ratios.

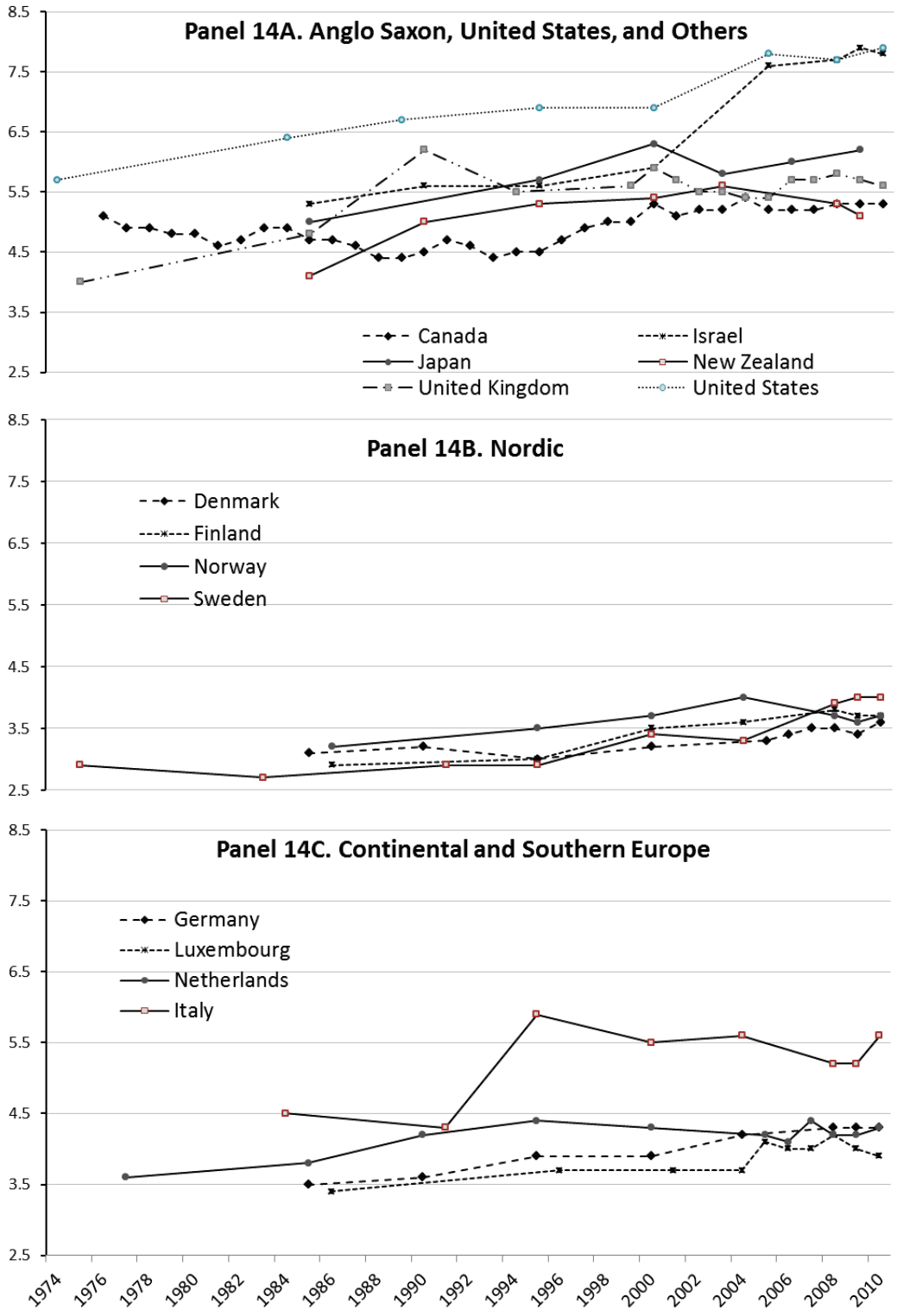
countries and calculated S80/S20 and P90/P10 ratios. Both of these alternative measures yield largely similar trends in income inequality to what we saw for the Gini coefficient in Figure 13.

The share of income received by the top quintile divided by the share of income received by the bottom quintile (S80/S20) has risen in each of these countries since the early 1980s, but some countries experienced larger increases in inequality, and the rank ordering changed somewhat (Figure 14). Israel experienced the largest absolute change over this period, with its S80/S20 rising by 2.5, basically matching the United States for top spot with the top fifth of households receiving 7.8 times as much income as those in the bottom fifth. Israel's inequality surge occurred in late 1990s and early 2000s. Sweden experienced the largest relative increase over the same period, with its S80/S20 rising 48 percent. Canada experienced the smallest increase among these countries, with its S80/S20 rising less than ten percent higher than its lowest point in the 1980s.

Shifting to an inequality measure that further sharpens the contrast between the top and bottom of income distribution, the P90/P10 inter-decile ratio does little to change the trends (Figure 15). Similar to the S80/S20 measure, income inequality did rise in each of the countries over this period. For Israel and Japan, the distribution seems to have grown even more unequal using the P90/10 ratio. By the mid-2000s Israel had supplanted the United States as the most unequal rich nation, with households at the 90^{th} percentile receiving disposable household incomes 6.4 times greater than those at the 10^{th} percentile. In Japan the P90/P10 ratio rose 30 percent over these three decades.

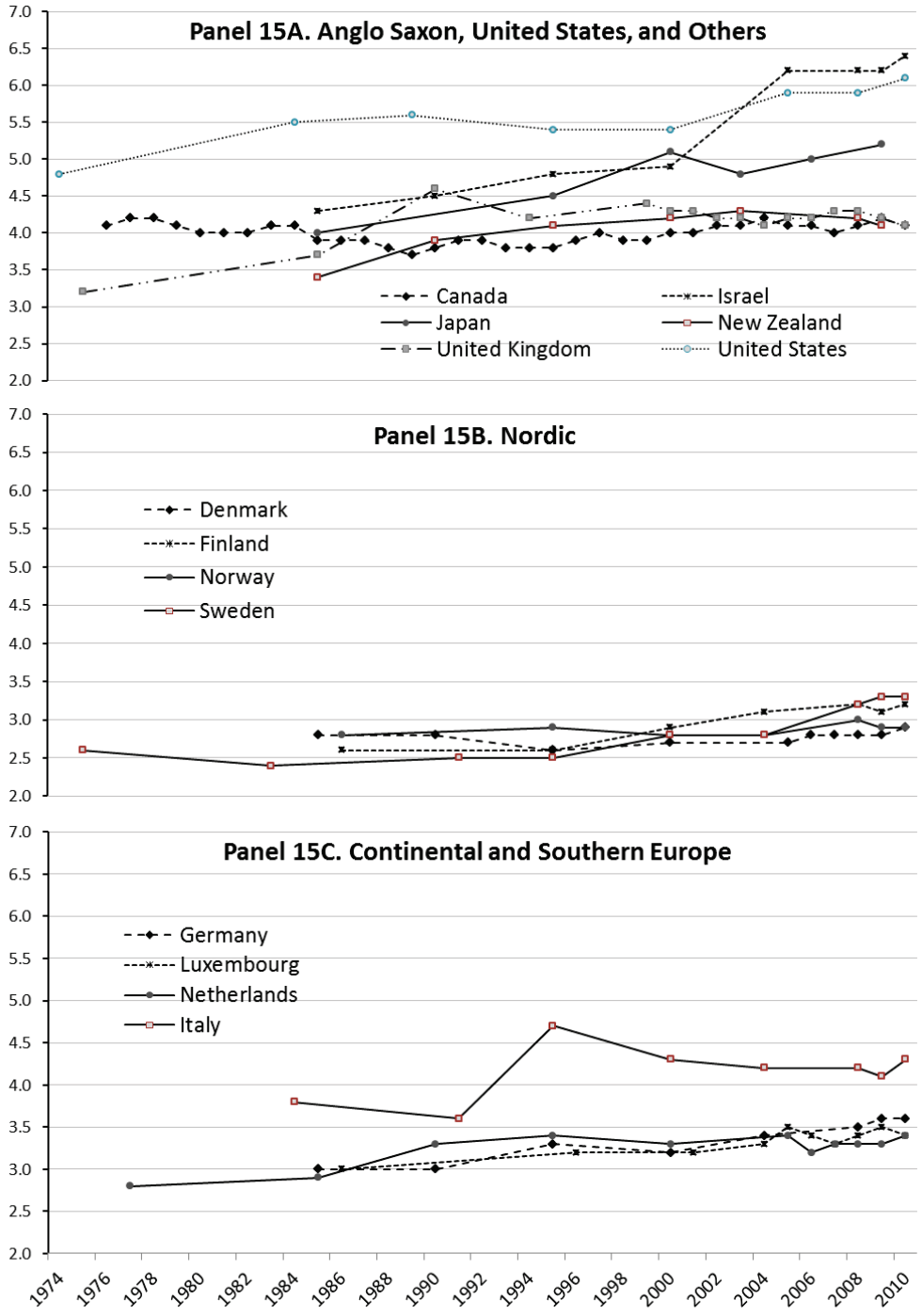
In most cases, though, the rise in inequality since the early 1980s is equivalent to or somewhat smaller than what is indicated by trends in the S80/S20. In the case of Canada, the 2010 value for the P90/P10 ratio was equal to its 1983 value but 0.4 above its low-point in the 1980s. In all of the Nordic and Continental Europe countries except the Netherlands, the P90/P10 ratio rose less in percentage terms than the S80/S20 did over the same period.

Figure 14. Trends in S80/S20 for Equivalized DHI by Country Group, OECD Data



Source: OECD income distribution data.

Figure 15. Trends in P90/P10 for Equivalized DHI by Country Group, OECD Data



Source: OECD income distribution data.

4A.iv.c. Trends in Pre-Tax and Transfer Gini Coefficients and the Extent of Redistribution for OECD Countries

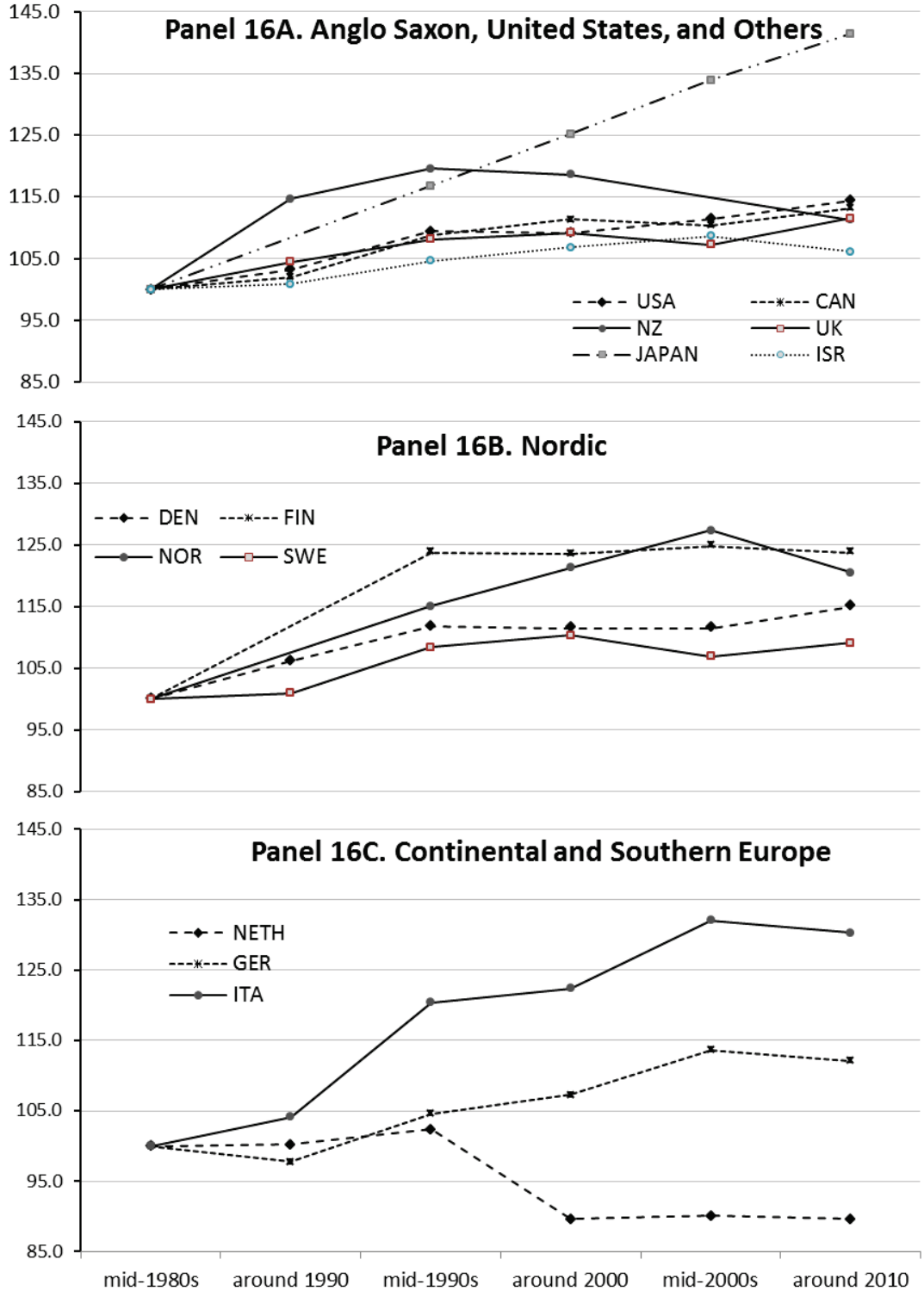
Trends in the distribution of pre-tax and transfer income (using the Gini coefficient) and the extent of redistribution can be explored using the same data, which are available for an expanded set of OECD countries, though for some only since the mid-1990s.

Japan is the country with largest increase in pre-tax and transfer inequality among these high-income countries, rising more than 40 percent and going from the least unequal distribution in the mid-1980s to one of the most unequal in 2010 (Figure 16, Panel A). (Figures 16 and 17 only include countries with data available for the mid-1980s and show the percentage change relative to the mid-1980s base.) Italy also experienced relatively large increases in inequality over this period, with its pre-tax and transfer Gini rising 30 percent (Panel C). Pre-tax and transfer inequality rose in most of these countries. In the Anglo Saxon countries and the United States, the increases were concentrated in the 1980s and early 1990s; in the Nordic and Continental European countries Gini coefficients rose most in the early 1990s. The only country that appeared to avoid rising pre-tax and transfer inequality was the Netherlands. The pre-tax and transfer Gini actually fell more than 10 percent in Finland in the late 1990s. For the latter three countries, however, data are only available since the mid-1990s. In the Netherlands, increases in the pre-tax and transfer Gini coefficient in the 1980s were offset by decreases in the late 1990s. New Zealand also experienced declining inequality in the 2000s. A number of countries (including Finland, Israel, and Sweden) have witnessed very little change in pre-tax inequality over the last 15 years, with Gini coefficients only fluctuating slightly between the mid-1990s and 2010.[30]

Incorporating the influence of taxes and transfers can produce inequality trends that appear quite different, in some cases, than what we see in market or pre-tax and transfer income. (See Deding and Schmidt, 2002 for earlier analysis of this issue during the 1990s.) Trends in the Gini coefficients using

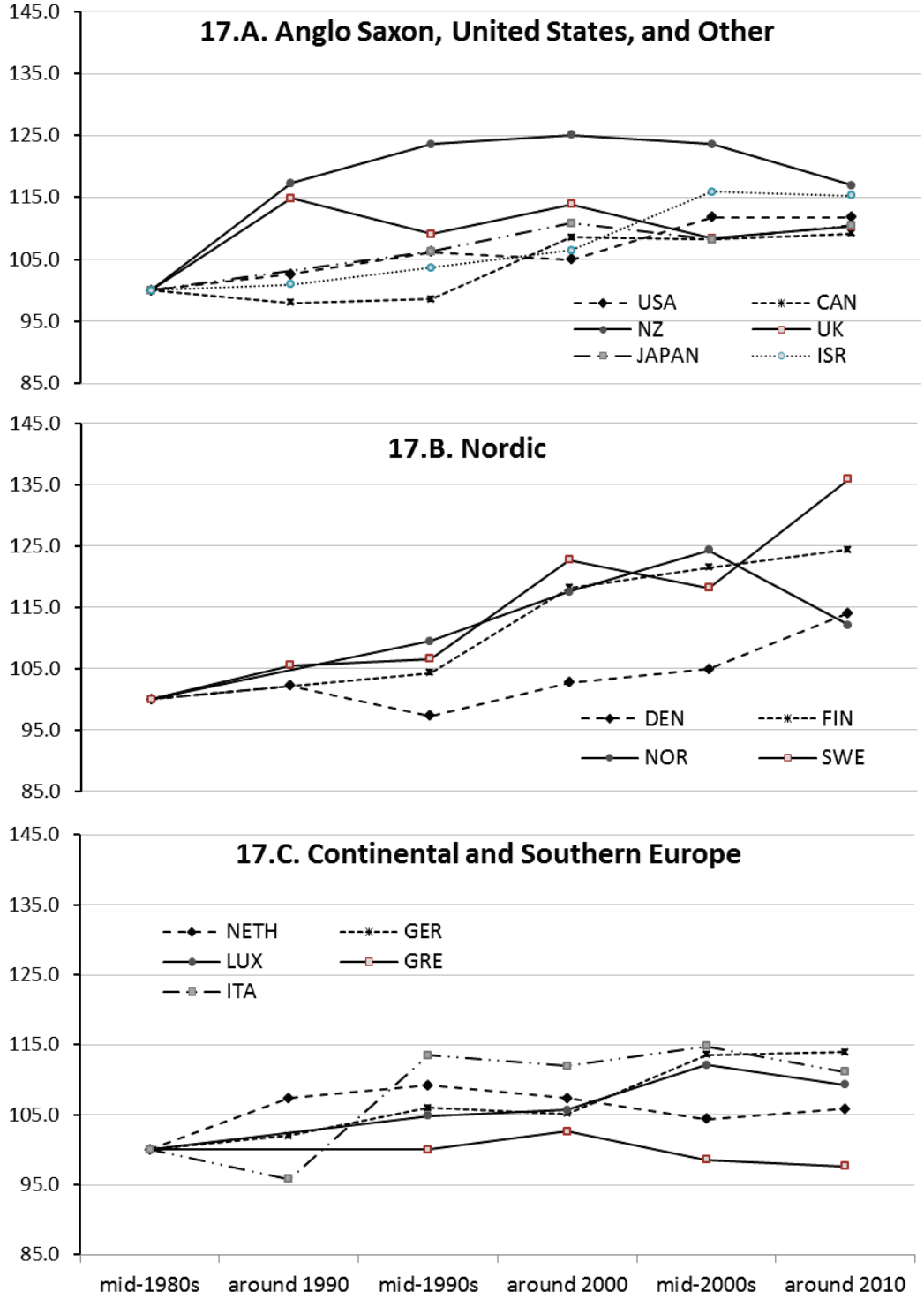
[30]For some countries, at least, this finding only holds in income excluding capital gains. In Sweden, for example, inclusion of capital gains income results in sizable increases in pre-tax and transfer Gini coefficients over this period (Atkinson and Morelli, 2012).

Figure 16. Change in Pre-Tax and Transfer Income Gini (Mid-1890s=100) for OECD Countries, by Country Group



Source: OECD Inequality Database, accessed October 23, 2013.

Figure 17. Change in Disposable Household Income Gini (Mid-1980s=100) for OECD Countries, by Country Group



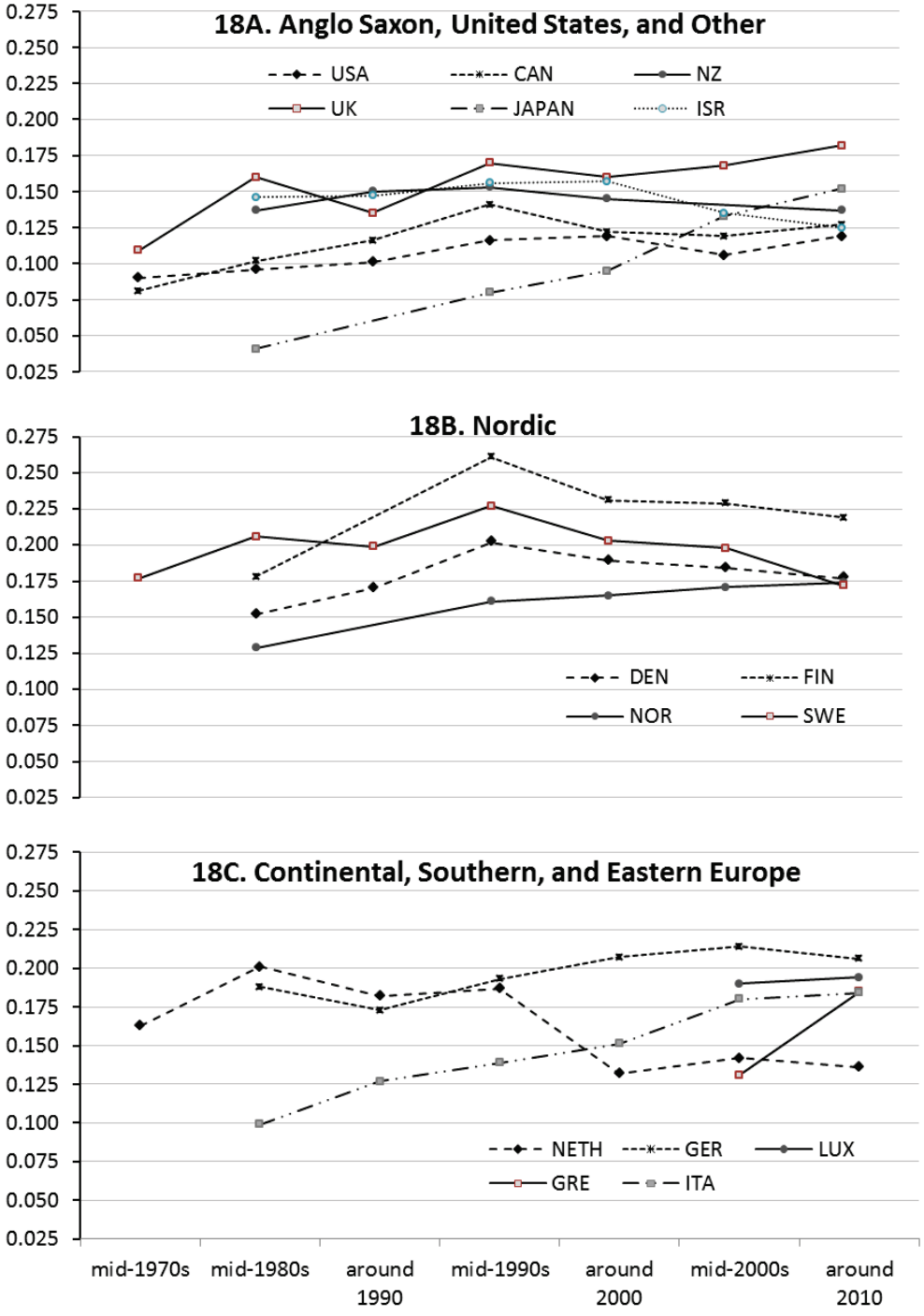
Source: OECD Inequality Database, accessed October 23, 2013.

Equalized Disposable Household Income for the same countries over the same period are shown in Figure 17. For some countries trends for the DHI and pre-tax and transfer Gini coefficients are very similar. The United States, for example, saw the pre-tax and transfer Gini coefficient rise 14 percent between the mid-1980s and 2010, while its DHI Gini coefficient rose 12 percent. The United States is one of the countries for which excluding trends for the 1970s substantially understates its rise in inequality; between the mid-1970s and 2010 the U.S. pre-tax and transfer Gini rose 23 percent and its DHI Gini rose 20 percent.

Denmark, Finland (Panel B), and Germany (Panel C) also saw similar increases in the Gini coefficient before and after the inclusion of taxes and transfers. For a number of countries, though, the inclusion of taxes and transfers produces markedly different trends in inequality. For Canada, Japan, Italy, Norway, and the United Kingdom, rising inequality in the distribution of income is blunted once taxes and transfers are included. Japan and Italy, the countries with the largest increases in pre-tax and transfer inequality in Figure 16 experienced increases in their DHI inequality only one-quarter and one third as large, respectively. The opposite is the case for Sweden, the Netherlands, Israel, and New Zealand, which experienced larger increases in inequality after including taxes and transfers. In the case of Sweden, the Gini for pre-tax and transfer income rose 9 percent (from .40 to .44) between the mid-1980s and 2010, while the Gini for DHI rose 36 percent (from .19 to .27).

The differences in the trends illustrated in Figures 16 and 17 are partly a result of the evolution of the tax and transfer systems in these countries. (As mentioned previously, changes in the age of population, and other demographic and policy factors can influence these trends as well.) Figure 18 shows how the extent to which tax and transfers reduce the Ginis for pre-tax and transfer incomes has changed over this period. The most striking pattern in Figure 18 is the dramatic and sustained increase in tax and transfer "redistribution" in most rich nations from the mid-1970s up through the mid-1990s, which were followed by steady declines in the decade-and-a-half since. The Anglo Saxon (Panel A) and Nordic countries (Panel B) in particular followed an "inverse U-shaped" pattern, with redistributive efforts rising between the mid-1970s and mid-1990s, but declining after that point. Since around 2000, taxes and transfers have also played a smaller role in reducing market income inequality in Israel.

Figure 18. Reduction in Gini Coefficient Due to Taxes and Transfers Trends for OECD Countries, by Country Group



Source: OECD Inequality Database, accessed October 23, 2013.

In some countries the redistributive "impact" did not subside in the 1990s. Japan (Panel A) and Italy (Panel C) both experienced steady increases in redistribution between the 1990 and up through the late-2000s. The impact of redistribution has fluctuated less in the United States than in most other high-income countries. Increased redistribution in Canada and Japan, though, has shifted the United States from having one of the lowest levels of redistribution to having the lowest among rich nations. (See Immervoll and Richardson, 2011; Caminada et al., 2012; and Wang and Caminada, 2011 for more detailed discussion of the specific policies and their contribution to reducing market inequality in OECD and LIS countries.) (Gini coefficients for pre-tax and transfer income, disposable household income, and the difference between the two, for the OECD countries are shown in Table 5.)

4A.iv.d. Comparing Trends in DHI Inequality for All Ages and Working-Age

Previously we described how age composition is important to understanding how taxes and transfers affect cross-national rankings for income inequality. We can use the same OECD data to evaluate trends in income distribution statistics for the working-age population, and contrast them with trends for the overall population. Table 6 includes S80/S20 and P90/P10 ratios, and Gini coefficients using equivalized disposable household income for a selection of years between the mid-1980s and 2010 for high-income OECD countries.

Over the entire twenty-five year period the distribution of income grew even more unequal among the working-age in almost every country. The largest differences can be seen among the Nordic countries. In Norway and Sweden, the P90/P10 ratio rose 20 percent and 15 percent more, respectively, among the working-age than for the overall population between the mid-1980s and 2010 (Panel A). Smaller differences can be seen for the United States, United Kingdom, and Canada, which saw inequality increase between 4 and 8 percent more among the working-age than among all ages combined. Israel is the only country to see larger increases among the overall population than the working-age, although New Zealand also saw larger increases among the overall population after the mid-1990s. For

Table 5. Gini Index for Market Income and Post-Tax-Transfer Income, and the extent of Redistribution

	Mid-1970s	Mid-1980s	Around 1990	Mid-1990s	Around 2000	Mid-2000s	Around 2010
Panel 1: Market Income							
Australia				0.467	0.476	0.465	0.469
Austria						0.464	0.479
Belgium						0.482	0.478
Canada	0.385	0.395	0.403	0.43	0.44	0.436	0.447
Czech Republic				0.442	0.472	0.461	0.449
Denmark		0.373	0.396	0.417	0.416	0.416	0.429
Estonia						0.485	0.487
Finland		0.387		0.479	0.478	0.483	0.479
France				0.473	0.49	0.485	0.505
Germany		0.439	0.429	0.459	0.471	0.499	0.492
Greece						0.471	0.522
Hungary							
Iceland						0.373	0.393
Ireland						0.504	0.591
Israel		0.472	0.476	0.494	0.504	0.513	0.501
Italy		0.386	0.402	0.465	0.472	0.51	0.503
Japan		0.345	..	0.403	0.432	0.462	0.488
Luxembourg						0.467	0.464
Netherlands	0.426	0.473	0.474	0.484	0.424	0.426	0.424
New Zealand		0.408	0.468	0.488	0.484		0.454
Norway		0.351		0.404	0.426	0.447	0.423
Poland						0.521	0.468
Portugal						0.498	0.522
Slovak Republic						0.462	0.437
Slovenia						0.448	0.453
South Korea						0.33	0.342
Spain						0.463	0.507
Sweden	0.389	0.404	0.408	0.438	0.446	0.432	0.441
Switzerland							0.372
Turkey							
United Kingdom	0.378	0.469	0.49	0.507	0.512	0.503	0.523
United States	0.406	0.436	0.45	0.477	0.476	0.486	0.499
Russian Federation							0.486

(table continues)

Table 5, continued

	Mid-1970s	Mid-1980s	Around 1990	Mid-1990s	Around 2000	Mid-2000s	Around 2010
Panel 2: Post Tax & Transfer (DHI)							
Australia				0.309	0.317	0.315	0.334
Austria						0.26	0.267
Belgium						0.269	0.262
Canada	0.304	0.293	0.287	0.289	0.318	0.317	0.32
Czech Republic			0.232	0.257	0.26	0.259	0.256
Denmark		0.221	0.226	0.215	0.227	0.232	0.252
Estonia						0.337	0.319
Finland		0.209		0.218	0.247	0.254	0.26
France				0.277	0.287	0.288	0.303
Germany		0.251	0.256	0.266	0.264	0.285	0.286
Greece	0.424	0.345		0.345	0.354	0.34	0.337
Hungary			0.273	0.294	0.293	0.291	0.272
Iceland						0.269	0.244
Ireland						0.315	0.331
Israel		0.326	0.329	0.338	0.347	0.378	0.376
Italy		0.287	0.275	0.326	0.321	0.33	0.319
Japan		0.304		0.323	0.337	0.329	0.336
Luxembourg		0.247		0.259	0.261	0.277	0.27
Netherlands	0.263	0.272	0.292	0.297	0.292	0.284	0.288
New Zealand		0.271	0.318	0.335	0.339	0.335	0.317
Norway		0.222		0.243	0.261	0.276	0.249
Poland						0.326	0.305
Portugal						0.373	0.344
Slovak Republic						0.275	0.261
Slovenia						0.245	0.246
South Korea						0.306	0.311
Spain						0.324	0.338
Sweden	0.212	0.198	0.209	0.211	0.243	0.234	0.269
Switzerland							0.298
Turkey		0.434		0.49		0.43	0.411
United Kingdom	0.269	0.309	0.355	0.337	0.352	0.335	0.341
United States	0.316	0.34	0.349	0.361	0.357	0.38	0.38
Russian Federation							0.428

(table continues)

Table 5, continued

	Mid-1970s	Mid-1980s	Around 1990	Mid-1990s	Around 2000	Mid-2000s	Around 2010
Panel 3: Redistribution (Market Gini less DHI Gini)							
Australia				0.158	0.159	0.15	0.135
Austria						0.204	0.212
Belgium						0.213	0.216
Canada	0.081	0.102	0.116	0.141	0.122	0.119	0.127
Czech Republic				0.185	0.212	0.202	0.193
Denmark		0.152	0.17	0.202	0.189	0.184	0.177
Estonia						0.148	0.168
Finland		0.178		0.261	0.231	0.229	0.219
France				0.196	0.203	0.197	0.202
Germany		0.188	0.173	0.193	0.207	0.214	0.206
Greece						0.131	0.185
Hungary							
Iceland						0.104	0.149
Ireland						0.189	0.26
Israel		0.146	0.147	0.156	0.157	0.135	0.125
Italy		0.099	0.127	0.139	0.151	0.18	0.184
Japan		0.041		0.08	0.095	0.133	0.152
Luxembourg						0.19	0.194
Netherlands	0.163	0.201	0.182	0.187	0.132	0.142	0.136
New Zealand		0.137	0.15	0.153	0.145		0.137
Norway		0.129		0.161	0.165	0.171	0.174
Poland						0.195	0.163
Portugal						0.125	0.178
Slovak Republic						0.187	0.176
Slovenia						0.203	0.207
South Korea						0.024	0.031
Spain						0.139	0.169
Sweden	0.177	0.206	0.199	0.227	0.203	0.198	0.172
Switzerland							0.074
Turkey							
United Kingdom	0.109	0.16	0.135	0.17	0.16	0.168	0.182
United States	0.09	0.096	0.101	0.116	0.119	0.106	0.119
Russian Federation							0.058

Note: For most OECD countries "Around 2010" is for the year 2010, with some exceptions: (South Korea, 2011; Hungary, Ireland, Japan, New Zealand, Switzerland, and Turkey, 2009; Russian Federation, 2008).
Source: OECD Inequality Database. Accessed October 23, 2013.

Table 6. Comparing Trends in Equivalized DHI Inequality For All Ages and For Working-Age, by Measure by Country

	All Ages				Working Age				%Change Mid-80s To 2010		%Change 1995 to 2010		%Change 2005 to 2010	
	1985	**1995**	**2005**	**2010**	**1985**	**1995**	**2005**	**2010**	All Ages	Working Age	All Ages	Working Age	All Ages	Working Age
Panel A. P90/P10 Ratio														
Canada	3.9	3.8	4.1	4.1	4	4	4.4	4.4	5%	10%	8%	10%	0%	0%
Denmark	2.8	2.6	2.7	2.9	2.5	2.5	2.7	2.9	4%	16%	12%	16%	7%	7%
Finland	2.6	2.6	3.1	3.2	2.6	2.7	3.1	3.3	23%	27%	23%	22%	3%	6%
Germany	3	3.3	3.4	3.6	2.9	3.2	3.5	3.6	20%	24%	9%	13%	6%	3%
Israel	4.3	4.8	6.2	6.4	4.4	4.8	6.1	6.1	49%	39%	33%	27%	3%	0%
Italy	3.8	4.7	4.2	4.3	3.6	4.6	4	4.5	13%	25%	-9%	-2%	2%	13%
Japan	4	4.5	5	5.2	4	4.5	4.9	5.3	30%	33%	16%	18%	4%	8%
Luxembourg	3	3.2	3.5	3.4	2.9	3.2	3.6	3.4	13%	17%	6%	6%	-3%	-6%
Netherlands	2.9	3.4	3.4	3.4	3	3.5	3.5	3.6	17%	20%	0%	3%	0%	3%
New Zealand	3.4	4.1	4.3	4.1	3.4	4.3	4.6	4.1	21%	21%	0%	-5%	-5%	-11%
Norway	2.8	2.9	2.8	2.9	2.6	2.8	2.9	3.2	4%	23%	0%	14%	4%	10%
Sweden	2.4	2.5	2.8	3.3	2.3	2.6	2.9	3.5	38%	52%	32%	35%	18%	21%
United Kingdom	3.7	4.2	4.2	4.1	3.7	4.1	4.4	4.4	11%	19%	-2%	7%	-2%	0%
United States	5.5	5.4	5.9	6.1	5.3	5.3	5.7	6.1	11%	15%	13%	15%	3%	7%
Panel B. S80/S20 Ratio														
Canada	4.7	4.5	5.2	5.3	4.8	4.8	5.6	5.6	13%	17%	18%	17%	2%	0%
Denmark	3.1	3	3.3	3.6	3	2.9	3.3	3.7	16%	23%	20%	28%	9%	12%
Finland	2.9	3	3.6	3.7	2.9	3.1	3.7	3.9	28%	34%	23%	26%	3%	5%
Germany	3.5	3.9	4.2	4.3	3.5	3.9	4.4	4.4	23%	26%	10%	13%	2%	0%
Greece	6.2	6.2	5.8	6	6.1	5.8	5.9	6.1	-3%	0%	-3%	5%	3%	3%
Israel	5.3	5.6	7.6	7.8	5.4	5.6	7.5	7.6	47%	41%	39%	36%	3%	1%
Italy	4.5	5.9	5.6	5.6	4.4	5.9	5.5	5.8	24%	32%	-5%	-2%	0%	5%
Japan	5	5.7	6	6.2	5	5.5	5.9	6.2	24%	24%	9%	13%	3%	5%
Luxembourg	3.4	3.7	4.1	3.9	3.4	3.7	4.3	4	15%	18%	5%	8%	-5%	-7%
Netherlands	3.8	4.4	4.2	4.3	3.9	4.5	4.3	4.6	13%	18%	-2%	2%	2%	7%
New Zealand	4.1	5.3	5.6	5.1	4	5.4	5.9	5	24%	25%	-4%	-7%	-9%	-15%
Norway	3.2	3.5	4	3.7	3	3.5	4.2	4	16%	33%	6%	14%	-8%	-5%
Sweden	2.7	2.9	3.3	4	2.6	3.1	3.4	4.3	48%	65%	38%	39%	21%	26%
United Kingdom	4.8	5.5	5.4	5.6	5	5.8	5.8	6.2	17%	24%	2%	7%	4%	7%
United States	6.4	6.9	7.8	7.9	6.1	6.7	7.6	7.9	23%	30%	14%	18%	1%	4%

(table continues)

Table 6, continued

	All Ages				Working Age				%Change Mid-80s To 2010		%Change 1995 to 2010		%Change 2005 to 2010	
	1985	**1995**	**2005**	**2010**	**1985**	**1995**	**2005**	**2010**	All Ages	Working Age	All Ages	Working Age	All Ages	Working Age
Panel C. Gini Coefficient														
Canada	0.293	0.289	0.317	0.32	0.291	0.293	0.322	0.324	9%	11%	11%	11%	1%	1%
Denmark	0.221	0.215	0.232	0.252	0.209	0.206	0.227	0.248	14%	19%	17%	20%	9%	9%
Finland	0.209	0.218	0.254	0.26	0.206	0.224	0.253	0.263	24%	28%	19%	17%	2%	4%
Germany	0.251	0.266	0.285	0.286	0.246	0.267	0.288	0.285	14%	16%	8%	7%	0%	-1%
Greece	0.345	0.345	0.34	0.337	0.344	0.336	0.337	0.338	-2%	-2%	-2%	1%	-1%	0%
Israel	0.326	0.338	0.378	0.376	0.317	0.329	0.374	0.368	15%	16%	11%	12%	-1%	-2%
Italy	0.287	0.3258	0.3295	0.319	0.284	0.3235	0.3243	0.321	11%	13%	-2%	-1%	-3%	-1%
Japan	0.304	0.323	0.329	0.336	0.304	0.319	0.323	0.332	11%	9%	4%	4%	2%	3%
Luxembourg	0.247	0.259	0.277	0.27	0.239	0.261	0.281	0.272	9%	14%	4%	4%	-3%	-3%
Netherlands	0.272	0.297	0.284	0.288	0.273	0.298	0.285	0.293	6%	7%	-3%	-2%	1%	3%
New Zealand	0.271	0.335	0.335	0.317	0.264	0.329	0.329	0.306	17%	16%	-5%	-7%	-5%	-7%
Norway	0.222	0.243	0.276	0.249	0.211	0.237	0.284	0.257	12%	22%	2%	8%	-10%	-10%
Sweden	0.198	0.211	0.234	0.269	0.195	0.216	0.236	0.27	36%	38%	27%	25%	15%	14%
United Kingdom	0.309	0.337	0.335	0.341	0.305	0.334	0.335	0.347	10%	14%	1%	4%	2%	4%
United States	0.34	0.361	0.38	0.38	0.329	0.351	0.373	0.375	12%	14%	5%	7%	0%	1%

Source: OECD Income Distribution Database, accessed November 8, 2013. Some data for some countries are from the following years: FIN (1986, 2004); GRC (1986, 1994); ITA (1984, 2004); JAP (2006, 2009); LUX (1986, 1996); NZ (2003, 2009); NOR (1986, 2004); SWE (1983, 2004); UK (1994), and; US (1984).

some of the countries, though, there is no notable difference in the inequality trends between the working-age and the overall population at any point or at least in more recent years.

The S80/S20 ratio measure yields a strikingly similar pattern of results (Panel B) as the P90/P10 ratio, but differences between the age group in Gini coefficient trends (Panel C) are more muted. Norway and Denmark saw DHI Gini coefficients rise 10 and 5 percent, respectively, more among the working-age than the overall population between 1985 and 2010. In most countries, however, trends in the Gini coefficient were only modestly greater among the working-age. The tails of the distribution have a greater impact on the S80/S20 and P90/P10 measures than they do on the Gini coefficient, and appear to be particularly relevant to understanding any differences in inequality trends for different age groups.

4B. Top Incomes

4B.i. Introduction

The first empirical section of this paper focused on incomes at the bottom of the distribution, relative to the poverty line. The previous section discussed trends in the overall distribution of income (e.g. Gini coefficients) suggesting that the distribution of income has become more unequal in most countries since the 1970s. This section shifts attention to the top of the distribution. Top incomes deserve a separate discussion as top income measures taken from households surveys are typically less accurate due to both sampling and non-sampling errors.

The main objective of this section is to discuss the trends of the so-called top income shares as computed from administrative tax statistics. Differently from Chapter 8, we focus here on the investigation of four decades since 1970. Moreover, we mainly describe here the trends in top shares, leaving out the discussion of what may have driven such trends (see Part III of the current Handbook). The methodological issues affecting the trends comparison over time and across countries also define a substantial part of this section. Indeed, we start here with an overview of the main features and limitations of the data with the objective to highlight how the latter can affect the comparability of the top shares over time and across countries. Where possible we illustrate how income at the top can be decomposed by

different sources highlighting the role of capital and wage incomes. Similarly we provide a brief description of the impact of fiscal policy on the post-tax top income shares. Differences in tax system can affect the level as well the trend of top shares differently across countries. Finally, we discuss how we can complement the two sources of information (tax and survey statistics) to improve our understanding of the evolution of income inequality.

The analysis in this section uses data on total income of the families, tax units, and individuals above the 99th percentile of the distribution. Therefore, unlike Chapter 8, this chapter does not focus on different income groups within the top decile. The data are collected and assembled from tax statistics, available from the World Top Incomes Database (WTID) by Alvaredo, Atkinson, Piketty, and Saez. The database is the result of years of work in a line of research initiated by Frankel and Hertzfeld (1943)[31] and Kuznets (1953), revived by Piketty (2001), and carried on in the subsequent collective works directed by Atkinson and Piketty (2007, 2009) who pulled together a number of contributions from different authors.[32]

Motivations for the surge of interest in incomes at the top of the distribution are varied. On the one hand, the WTID database constitutes a unique source of information covering most of the twentieth century (and in few cases the beginning of the twenty-first century as well). As shown in great detail in Chapter 8, this is a crucial advantage for studies of income distribution, usually plagued by data limitations.

On the other hand, the analysis of top income shares helps to offer better understanding of the post-1970 dynamics of income distribution and its determinants. First of all, the share of total income

---

[31]Although Kutznets is often considered to be the pioneer of this stream of literature, Alvaredo and Atkinson (2010) noted that "Frankel and Herzfeld (1943) published estimates of the European income distribution in South Africa based on the income tax returns, but making use of control totals from the census of population and from the national accounts. Their use of external information to complement income tax data pre-dated by ten years the study of upper income groups in the United States by Kuznets (1953)."

[32]The reader is directed to the WTID website at http://topincomes.g-mond.parisschoolofeconomics.eu/ for a complete list of the sources of the data.

captured by a tiny minority of the population has been rising continuously since 1980s in many advanced countries, and this has fueled concerns about the social inclusiveness of economic growth. In the United States, "the top 1 percent captured 58 percent of real economic growth per family" during the 1976–2007 period (Atkinson, Piketty, and Saez—hereafter APS—2011, 8). Findings such as these likely motivated the Managing Director of the International Monetary Fund, Christine Lagarde, in referring to inequality and the inclusiveness of growth as one of the three future challenges of the global economy that the IMF aims to address.[33]

Secondly, understanding the dynamics of the share of total income of the upper income brackets may be crucial to understanding changes in the overall income distribution. This has been shown empirically by Leigh (2007) and Smeeding and Thompson (2011), and discussed more formally in Atkinson (2007) and Alvaredo (2011). As in Chapter 8, we recognize here that the relationship between top shares and other income inequality measures may well be changing over time. In particular, we exploit disaggregated evidence for different decades to show that such a relationship has weakened since the 1990s. This differentiates our conclusions from those of Chapter 8, calling for extra prudence in using top shares as a proxy for the overall income distribution as obtained from household surveys. Furthermore, academic research has shown that the information contained within standard surveys hardly captures incomes above the 99th percentile so that top income shares can be potentially used to adjust available measures of overall inequality such as the Gini coefficient discussed in the previous section.

Thirdly, top income shares have been particularly useful to studies of important issues in public economics, such as the elasticity of reported income to tax changes, the extent of income shifting and tax avoidance, and more generally the behavioral responses to changes in taxation. Finally, the new empirical evidence on top shares gave the economic profession a new challenge: conventional explanations of rising

---

[33] 'A better financial system' and overcoming the economic and financial crisis are the two other points. This refers to the Annual Meetings Speech in Tokyo, on October 12, 2012.

http://www.imf.org/external/np/speeches/2012/101212a.htm

income inequality since the end of Bretton Woods such as the skill-biased technological change and globalization forces are no longer sufficient to explain the evolution of top income shares across different developed countries.

4B.ii. Data and methodology

As mentioned above, our analysis makes use of the World Top Income Database (WTID) for 21 countries since 1970.[34] Generally the series are constructed using tax statistics and they make use of gross types of income (i.e. in the United States, the gross market income is defined before deductions, individual income taxes, payroll taxes, and all kinds of government transfers).

Top income shares are mostly calculated from detailed historically tabulated income tax statistics. Alternatively, tax administration micro-data are also increasingly used, especially for the last decades of the twentieth century. Information contained within the tax statistics is then combined with control totals for population and income. Essentially, tax statistics provide the total income and the total number of tax units for given income ranges and allow us to compare these values to the totals in the economy.[35] It is important to note that when using group tabulations data, the precise share of income accruing to a specific percentile within the top decile is obtained through interpolation techniques as the ranges of tax units within tabulations do not necessarily coincide with the percentage of the population for which we would like to assemble our data. Interpolation is commonly applied using distributional assumptions about the top tail of income distribution (e.g., Pareto distribution) or, alternatively, by computing lower and upper bounds for every share (e.g., the actual share can be obtained using the mean-split histogram as in Atkinson, 2005).

---

[34]The countries are Australia, Canada, China, Denmark, Finland, France, Germany, India, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

[35]This refers exclusively to tax-filers, which can be quite a small portion of the population especially in earlier years of the twentieth century. The assumption is that the top of the distribution is always sufficiently covered.

Broadly speaking, the choice between these two different interpolation techniques does not affect the substance of the results and interpolation errors have been generally proven to be negligible. This is particularly true when the information within the grouped tabulations is detailed and high quality.[36] While choice of interpolation technique does not appear to be crucial, other factors may substantially influence the accuracy of estimates of top income shares and the comparability of levels and trends across countries.[37]

4B.ii.a. Caveats and Limitations to the Data

Although top shares are calculated with similar methodologies across countries, there are a number of caveats that are important to consider.[38] This section summarizes and extends the discussion on the methodology for the derivation of top shares data found in previous papers. Differences and changes in methodology may (or may not) affect the comparability of data across countries as well as over time even within the individual country-specific series. Understanding the relevance of these issues will be the focus of the following subsections.

Reliance on tax statistics raises a number of important questions and concerns about the construction of top income shares. First of all, the income definition is tailored to follow administrative requirements implying that the definition of income, of income unit, etc., do not necessarily coincide with the preferred ones for research purposes.[39] Administrative criteria may also differ across countries or change over time (e.g. changes to tax legislation such as income sources subjected to taxation, tax units, etc.) generating comparability issues.

---

[36]See Atkinson (2003) for a detailed discussion.

[37]Atkinson, Piketty, and Saez cover these issues extensively in their 2011 *JEL* paper.

[38]The limitations of income tax data have been discussed extensively in Leigh (2009); Atkinson, Piketty, and Saez (2009, 2011); and Burkhauser , Larrimore, and Simon (2012).

[39]Ideally, the Haig-Simons definition of income would be preferred. This includes accruing capital gains and losses (not only realized), imputed rents, and fringe employment benefits.

Calculating comparable top share series also requires consistency between the numerator (total top income) and the denominator (total income in the economy). However, the control total for income is calculated in different ways across countries and over time in turn affecting the comparability of data. In addition, economic agents have incentives to change their behavior in order to minimize their tax liabilities and most probably understate their true income (e.g., tax avoidance, tax evasion, income shifting, etc.) and these incentives may vary with income and across tax systems.

Finally, the series are largely concerned with gross income before taxes so that the effective change in post-tax income inequality is dependent on changes in the effective tax rate of top income brackets. This has certainly changed dramatically over time and might not have followed a similar pattern in all countries. This is an issue of crucial importance although it is much less debated because of data limitations. This section addresses these issues separately.

Despite these concerns, it is worth noting that the literature on top-income shares has also highlighted the potential and the strength of these data, and generally concluded that these problems can be attenuated. The country-specific series are usually obtained from the same sources over time and we can easily identify breaks which may affect the measurement as well as indicate the direction and magnitude of the potential change. In addition, our focus on the post-1970 period allows us to have both better data and documentation to deal with these issues to a satisfactory level. For an analysis on the very long-run (approximately since 1750) we direct the reader to Chapter 8.

4B.ii.b. Definition of the Control Total for Income

Every top share is a fraction between the incomes accruing to a specific top income group with respect to the total income in the economy. The two definitions of income have to be consistent and there are different ways to come up with an estimate of the total pre-tax income in the economy.

As detailed in APS (2011) and illustrated within the previous chapter as well, one possible approach is to subtract specific categories of income from the total personal income within the national accounts. This is done in order to come as close as possible to the income definition reported in the tax

statistics (occasionally proportionally adjusted). This is the original approach pioneered by Frankel and Herzfeld (1943), then by Kuznets in 1953 and later adopted by Piketty in 2001 and used by most of the countries in the WTID.[40] The alternative approach is to inflate the total income that is reported in the tax statistics in order to correct the missing income of individuals who do not file a tax return (as done for the series for the United Kingdom, Finland, Netherlands, Sweden after 1942, Switzerland after 1971 and the United States after 1944). Whereas the first approach makes use of external control of income from national accounts sources, the second approach deals with sources of income which are mainly internal to the tax statistics.[41] In a few cases where national accounts are not available (this is especially true for earlier years) total income is estimated from the full population households survey (this was done for China) or as a share of GDP (this is the case for initial observations of Spanish and Portuguese top incomes).

As should be expected, these methodological differences may affect the level of the series as well as the trend. In particular, the cross-country trends comparison can be affected when different methodologies are systematically applied by different countries. Atkinson (2007) documents, for the case of the United Kingdom, how the ratio between total income based on tax statistics and total income from national accounts[42] has declined over time, falling from 0.9 at the beginning of the century to 0.85 in the last years of the century. Assuming that the ratio declined at a constant rate, we could obtain a rough estimate of the dynamics of the top income shares based on the control totals using national accounts. Despite the documented minor change, the impact on the top shares trend can be seen over time. The gap between the top shares reported in the WTID (using control total estimated from the tax statistics) and the ones we estimate based on a different control total rises from 1 percentage point in 1970 to 2 percentage

---

[40]Australia, Canada, Germany, India, Ireland, Italy, Japan, New Zealand, Norway, South Africa, and Sweden before 1942, Switzerland before 1971 and the United States before 1944.

[41]It is worth noting that additional information (external from tax sources) can also be used to estimate the income of non-filers (for example this is the case of the United Kingdom as done in Atkinson, 2005).

[42]Personal income minus transfers.

points in 2000. In the case of the United Kingdom, the two different approaches yield very similar trends over time, but the magnitude of the increase—whether the top 1 percent share rose 5 or 6 percentage points—is sensitive to the definition of control total. The differences could potentially influence comparisons of top income shares within and across countries at a point in time as well over time.[43]

4B.ii.c. Definition of Top Income

As discussed above, the income definition follows the administrative requirements for tax statistics which vary over time and across countries. In particular the income definition used within the WTID attempts to be as close as possible to the definition of gross total market income (net of government transfers, taxes, and deductions). Changes in tax legislation may allow the inclusion or the exclusion of particular income sources within the reported income (e.g. capital gains, dividends, income deductions, etc.). In other words, these changes may bring about an expansion or a reduction of the tax base. We discuss below three specific types of changes and structural breaks in taxation regimes that can create severe problems for the consistency over time of top shares estimates. Nonetheless, we also point out that these changes do not always result in actual breaks (in levels or trends) for the top income shares series.

The first type of change in taxation discussed here deals with the treatment of deductions within the tax statistics. Starting from 1976, the income of the U.K. series, for instance, is grossed up to include deductions which were previously subtracted from income:[44] "(i) allowable interest payments such as those for house purchase, (ii) alimony and maintenance payments, (iii) retirement annuity premiums, and (iv) other allowable annual payments" (Atkinson and Salverda, 2005). Such a change did not, however,

[43]There are, however, ways of avoiding the problem of control total altogether. The phenomenon of increasing inequality can be explained on one hand with the redistribution of resources towards the top 1 percent from the rest of the population (increase in top shares). On the other hand this has proceeded together with a redistribution of income in favor of the very rich within the top percentile. The latter increase in inequality within the top is described by the Pareto coefficients or by the so-called "shares within shares." These variables are by construction independent from the external control total.

[44]The income can be adjusted at the source for those countries where the information on deductions is available for income level. This is the case for the United States as shown in Piketty and Saez (2006).

cause a substantial change in the top income share; "the share of the top 1% was shown as rising from 5.6 to 5.7%, and that of the top 10% from 25.8% to 26.2%" (Atkinson and Salverda, 2005).

The second relevant type of taxation change concerns the treatment of capital income within the tax base. This problem is listed by APS (2011) as probably the "main shortcoming" of the WTID data undermining the comparability of the top income series. Indeed, the estimation of top income shares are based on the observation of reported income for taxation purposes and the restriction or the expansion of the tax base may represent misleading representation of the real changes of total income held by top income groups.

On one hand, many sources of income from capital (interest income, returns on pension funds, imputed rents, etc.) have disappeared from the income tax base over time as they have been either fully exempted from taxation or taxed separately. As reported in Iwamoto et al. (1995) and Moriguchi and Saez (2008), a substantial share of capital income, for example, was missing from the Japanese self-assessed income tax starting from 1947 "because almost all interest income has been either tax exempted or taxed separately and withheld at source. . . and so was a large part of dividends since 1965." However, as suggested in Moriguchi and Saez (2008), interests and dividends constitute only approximately 3 percent of total personal income in Japan and even assuming that top groups absorb the whole income from these sources, the top 1 percent would still be far below the pre-1945 levels and below U.S. top 1 percent share. Similarly, the French tax base shrank with the exclusion of imputed rents of homeowners as documented in Piketty (2001, 2003), who also provides some conservative estimates showing that the reduction of French top income shares was robust to the full imputation of tax-exempted capital income to reported income at the top.

On the other hand, the tax base may be expanding, generating a similar, but reversed, problem as the one discussed above. This is, for instance, described in Burkhauser, Hahn, and Wilkins (2013) for the case of Australia where the tax reform proposed in 1985 (and formally approved by 1987) aimed at broadening the tax base "in order to improve equity and efficiency."

Most importantly, the tax reform included realized capital gains within the personal income tax base as "prior to 1985, Australia had no general tax on capital gains" and reduced substantially the marginal tax rates on dividends by introducing the so called full-imputation system which no longer allowed dividends to be subjected to both corporate and income taxation.[45] More specifically both tax interventions (approved respectively in 1987 and 1986), on one hand, allowed to include within the income tax base, "most realized capital gains regardless of how long the asset was held. But to soften its effect, the reform applied only to assets purchased after September 19, 1985. Certain types of assets continued to be exempt, most importantly owner-occupied housing." (p. 8). On the other hand, the switch to a full imputation system increases enormously, although artificially, the reported dividends income.[46] However, Burkhauser, Hahn, and Wilkins further note that whereas the change in the tax law on dividends may have had an impact on the level of the share, the change in capital gains taxation had, instead, an impact which "grows over time with the stock of assets purchased after September 19, 1985 and the share of realized capital gains that enter the tax base" (p. 9, 2013). As reported in Burkhauser, Hahn, and Wilkins (2013), these issues were not directly addressed in Atkinson and Leigh (2007) and led them to overstate the real increasing trend of Australian top shares.[47]

Finally, the third type of taxation change relates to the treatment of capital gains within the income definition. This can be more problematic as this source of income is particularly important for the very top income brackets and increasingly so as capital gains have been receiving advantageous tax treatment with respect to dividends-type income in most advanced countries. As distributed, corporate profits became less advantageous (dividends are often taxed at the income tax rate and subject to double

---

[45]The Australian dividends tax reform in 1987 increased the corporate profits tax rate to the level of top income marginal tax rate (from 46 to 49 percent) However, as noted in Burkhauser, Hahn, and Wilkins (2013), "under the new 100 per cent imputation tax system contained in the reform legislation, these company taxes effectively became withholding taxes. This was the case since their payment could be used to offset personal income tax on dividends as well as other taxes."

[46]In order to better understand the mechanical increase in reported income resulting from the switch to full imputation system we refer the interested reader to Burkhauser, Hahn, and Wilkins (2013).

[47]This might be true especially given the fact that Atkinson and Leigh's series include capital gains.

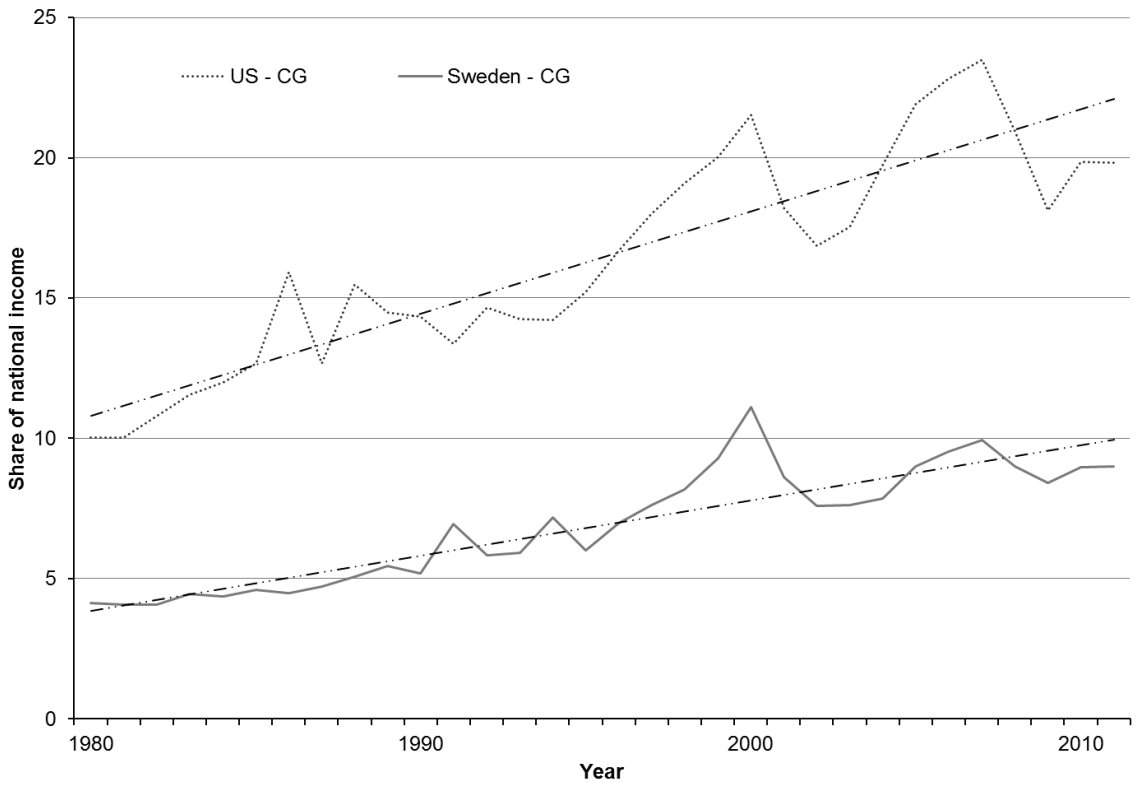
taxation, at the corporate level and individual level). Thus, including capital gains becomes fundamental "to assess the impact of retained profits of corporations on top individual incomes" (Atkinson, Piketty, and Saez, 2011). Moreover, due to favorable taxation, investors may be more willing to hold stocks with an underlying low pay-out ratio in order to cash in capital gains rather than dividends (e.g. clientele effect). These considerations suggest that excluding capital gains can leave out a considerable (and increasing) amount of the income of richer tax units, making static and temporal comparison of effective top income shares across countries more problematic, assuming that the extent of the relevance of capital gains and their dynamics differ among countries.

To illustrate the validity of the argument above we describe below how the top income share changes once capital gains are taken into account. However, this exercise can be done only for six countries, namely Canada, Japan, Germany, Spain, Sweden, and the United States.[48]

The role of capital gains for top income shares has been discussed in Roine and Waldenström (2012) for the case of Sweden where, they argue, excluding capital gains "severely underestimates the actual increase in inequality and, in particular, top income shares during recent decades." Indeed, Figure 19 shows that after including capital gains, the top income share in Sweden has a similar trend to the U.S. top 1 percent. Yet, the difference in level remains substantial. Figure 20 depicts the dynamics of top 1 percent income shares including and excluding capital gains for those countries for which data exist, suggesting that the importance of capital gains may also vary a great deal across countries. In the case of Germany, including capital gains income has essentially no impact on the top 1 percent share of income. Capital gains seem to affect the cyclicality of top shares in Japan, creating spikes but not persistent changes in level or trend. In Sweden, Canada, and Spain, the inclusion of capital gains income did not have a marked impact on the top 1 percent share prior to 1980 or 1990, but the influence of capital gains

[48]Indeed, most of the top shares series within the WTID exclude capital gains altogether, whereas in a few countries capital gains are only included where taxable. The latter, however, cannot be untangled from the total income as no income source decomposition is provided. This is the case for the United Kingdom (prior to the introduction of a separate Capital Gains Tax), Australia, New Zealand, and Norway.

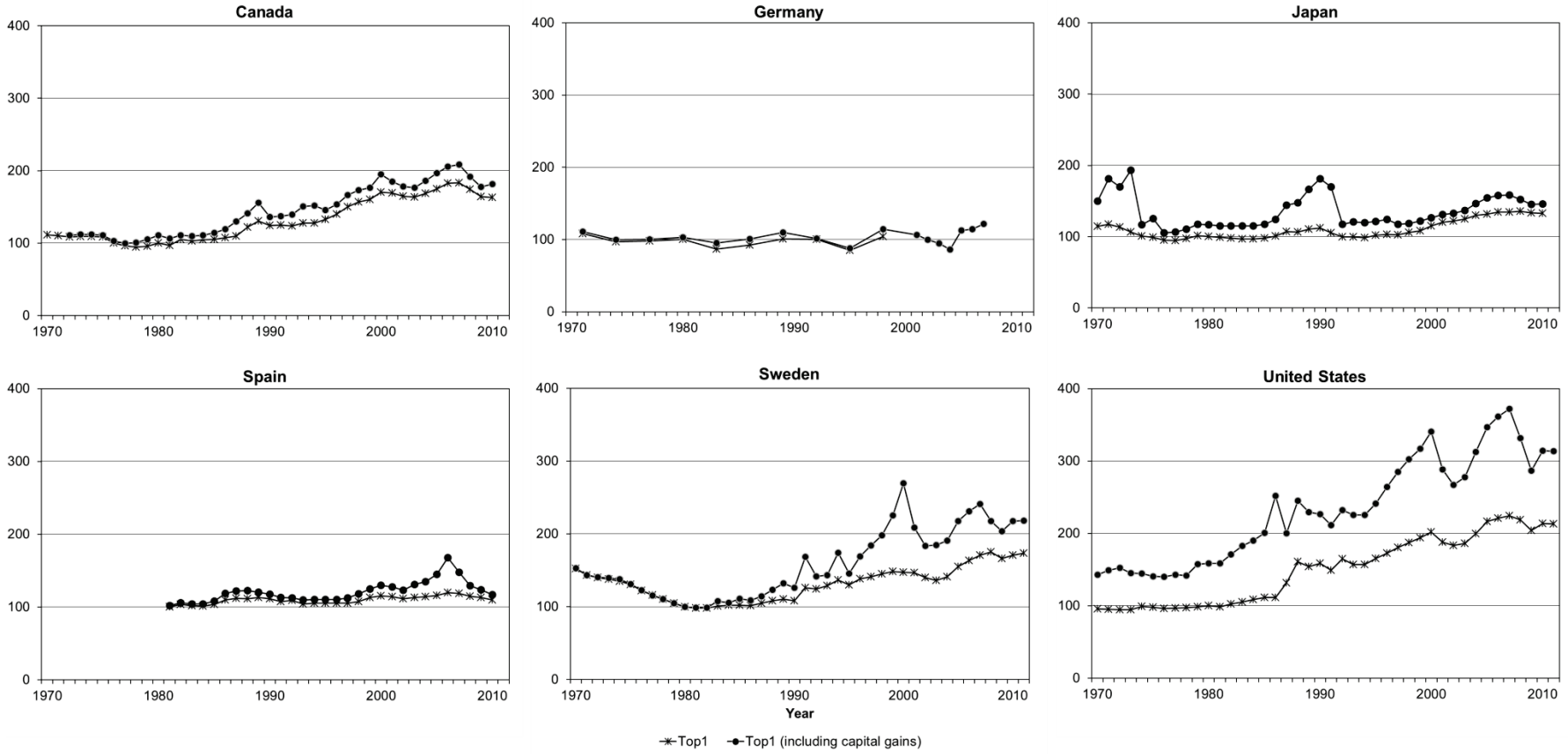
Figure 19. Top 1 Percent Share Trends in the United States and Sweden—Including Capital Gains (CG)



Source: World Top Income Database, accessed in August 2013.

Notes: The graph represents the top 1 percent share including capital gains for the United States and Sweden. The graph shows that despite the inclusion of capital gains the levels of the shares are substantially different across the two countries whereas the trend over time becomes similar.

Figure 20. Cross-Country Variation in the Impact of Including Capital Gains Income for Top 1 Percent Share Trends (1980=100)



Source: World Top Income Database, accessed in September 2013.

Note: The series of top 1 percent share excluding capital income are set equal to 100 in 1980. The series of top 1 percent shares including capital gains are calculated as following: top1cg=100*top1cg/top1.

has become increasingly large since the 1980s, influencing the perceived trend of top shares increase. For the United States, the inclusion of capital gains income has resulted in systematically higher top shares over the entire period. It is crucial to note that the relevant concept of capital gains discussed here is that concerning its "realized" component for tax purposes. Indeed, realized capital gains refer to the wedge between the selling and purchasing prices of the asset. Furthermore, realized losses are subtracted from realized gains in order to obtain the measure of *net* realized capital gains valid for taxation purposes. This is a concept very much different from the accrued capital gains which simply reflects the current differential between the "market price" and the purchase price. Indeed, individuals may realize capital losses for taxation purposes so that a series including capital gains is not necessarily more valid, informative or complete than a series excluding capital gains.

Changes in tax systems can also affect the unit of reference (e.g. change in tax units), the extent of tax evasion and avoidance, including the phenomena of income shifting (e.g. substitute wages with tax-exempted noncash compensation), and anticipation or postponement of income returns. These issues are of crucial importance and will be discussed below in separate sections.

4B.ii.d. Changes in Tax Avoidance and Tax Evasion

This section discusses the roles of (unlawful) tax evasion, (lawful) tax avoidance, and other behavioral responses to changes in taxation.

The use of tax data to estimate top income shares poses potentially serious problems resulting from under-reporting, re-timing of income reporting, and income shifting (depending on fiscal convenience). We discuss these important issues here in order to understand how they may affect the comparability of top shares series over time and across countries.[49]

---

[49]The specific composition of total reported income (e.g. capital vs. wage) may also be driven by tax convenience. In other words, capital and wage incomes are, to some extent, fungible and interchangeable. However, this issue is not discussed here as we are ready to assume that the "fungibility" of income sources does not affect the total reported income but only its composition. This issue will become relevant within the section where we explicitly discuss the composition of income at the top.

Work by Piketty, Saez, and Stantcheva (2012) has shown that most of the countries under investigation experienced a reduction in top marginal tax rate which was highly correlated with the surge in top income shares we observed in the three decades following the end of Bretton Woods (see Figure 21). The reduction in top marginal tax rate could indeed reduce the propensity to evade and avoid taxation, increasing the tax collection and therefore income reported at the top. Hence, the increase in inequality may be due to a reduction in tax avoidance due to lower tax rates for richer groups.[50] Indeed, Figure 21 shows how the top marginal tax rates changed over time for the sample of countries under investigation, highlighting a clear overall reduction in tax progressivity over time.

However, several researchers have devoted substantial attention to this aspect and pointed out that differences in level across countries and the upward trend in income inequality observed in many countries are substantially robust real phenomena rather than spurious results merely driven by tax avoidance and tax evasion (Leigh, 2009; Alvaredo and Saez, 2009; Alvaredo, 2010; Leigh and Van Eng, 2009; Roine and Waldenström, 2008; Banerjee and Piketty, 2005; Moriguchi and Saez, 2008).

First of all, as reported in Leigh (2009), the evidence suggests that income underreporting (the size of tax gap) does not substantially vary across countries, while tax regimes vary dramatically. In addition, the extent of tax avoidance (and the scope for evasion) at the very top of the income distribution may not necessarily be higher than that for the rest of the distribution given the public visibility of their sources of income and the efficient enforcement efforts of tax authorities (Alvaredo and Saez, 2009; Alvaredo, 2010; Leigh and Pierre Van Eng, 2009).

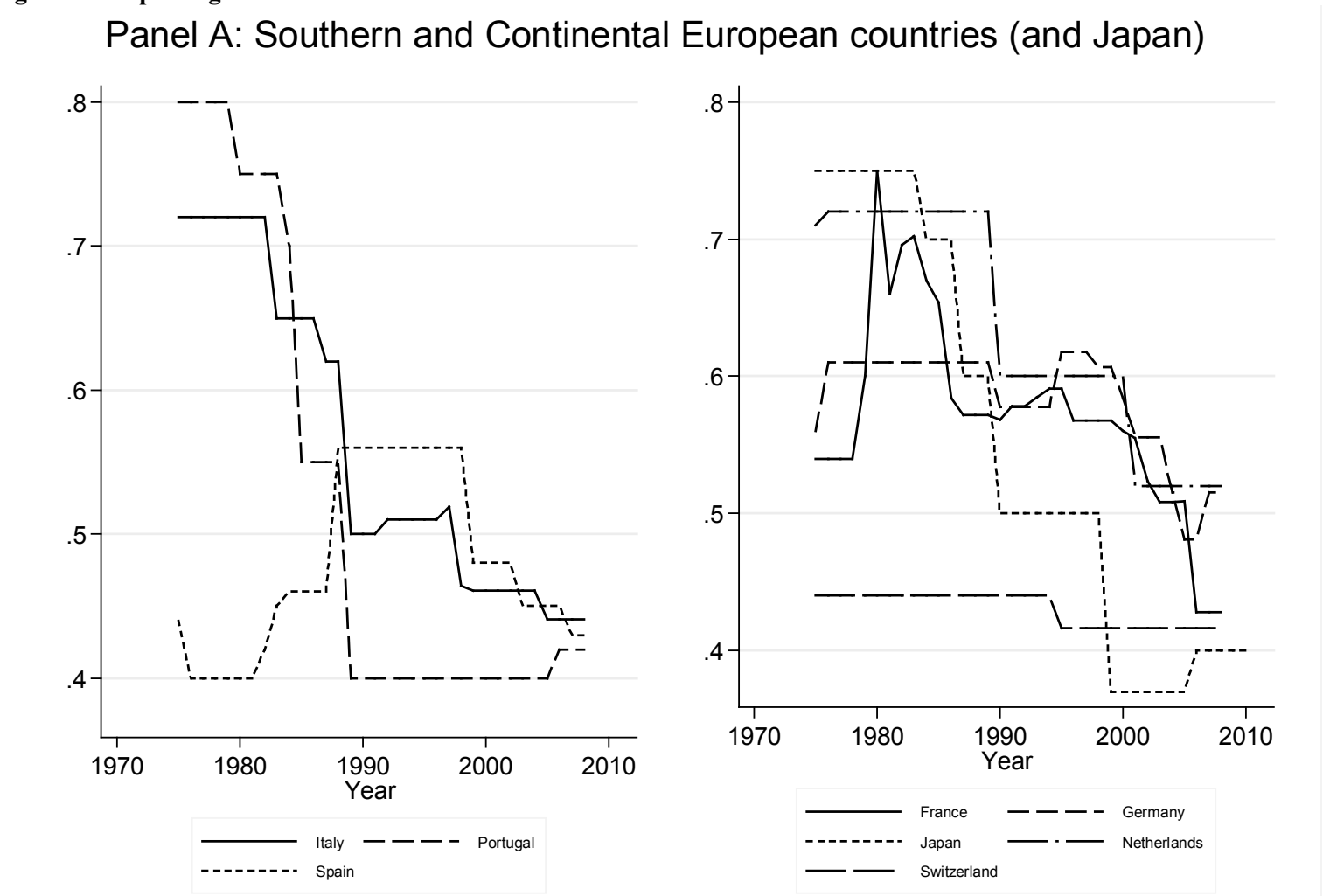
Secondly, despite the reduction in tax progressivity, one can argue that there is little evidence to suggest that the extent of tax avoidance among the richest households has been changing substantially over time, at least for relatively high-tax-compliance countries[51] (see Internal Revenue Service, 1996 and

---

[50]This case is made by Reynolds (2007) for the United States.

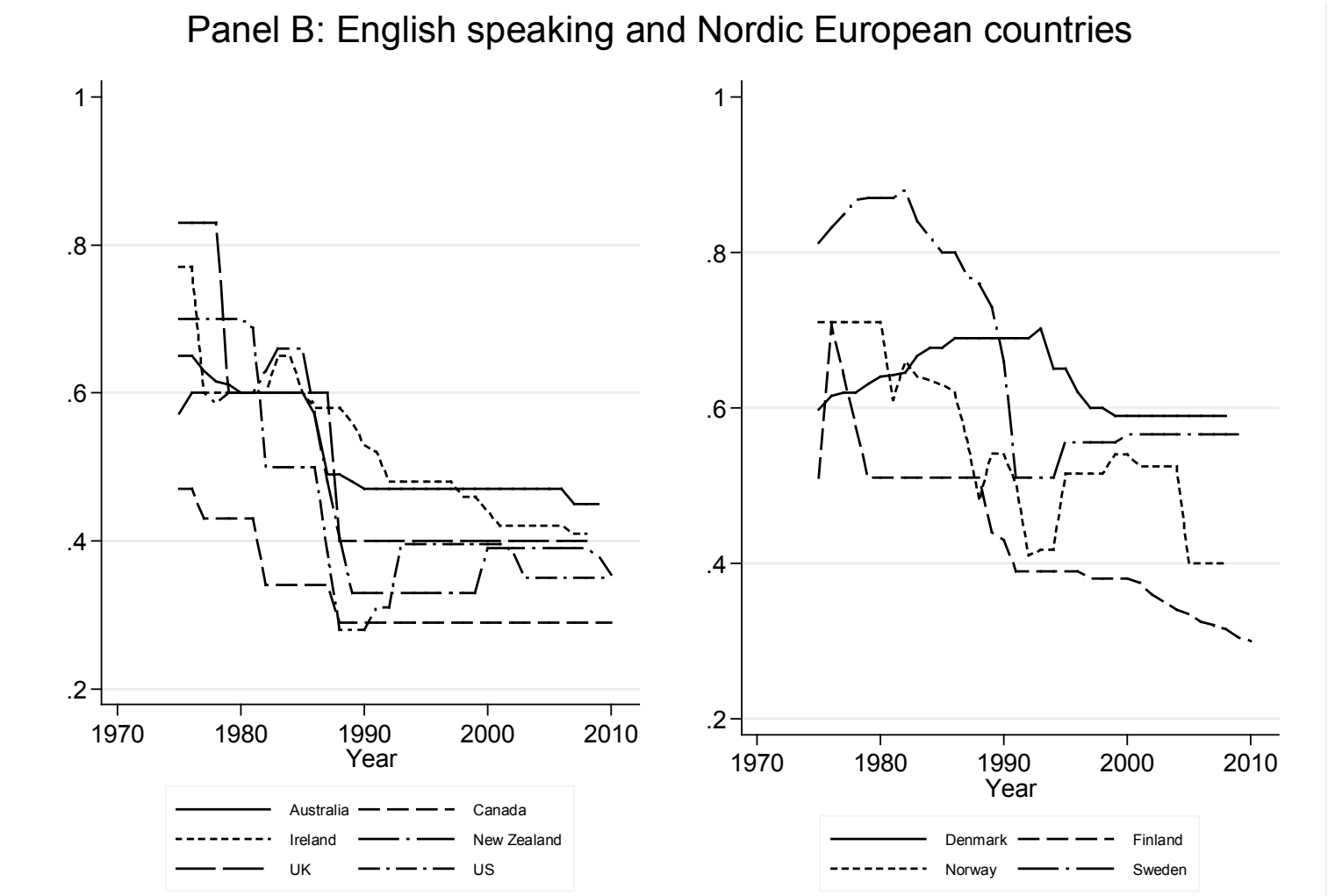
[51]This might be because government and tax authorities already had strong incentive and capability to enforce tax regulations in place when overall marginal rates at the top began to be reduced. Nonetheless, no evidence is available for countries outside the U.S. and Sweden, and any further generalisation is not prudent.

Figure 21. Top Marginal Tax Rates across Countries: 1970–2010



Source: Piketty, Saez, Stantcheva (2012).
Note: The figure depicts the top income tax rates (including both central and local government individual income taxes) over the period going from 1970 to 2010. Panel A focuses on Southern European countries and Continental European Countries (and Japan). Panel B focuses on Nordic European and Anglo-Saxon countries.

Figure 21, continued



Source: Piketty, Saez, Stantcheva (2012).
Note: The figure depicts the top income tax rates (including both central and local government individual income taxes) over the period going from 1970 to 2010. Panel A focuses on Southern European countries and Continental European Countries (and Japan). Panel B focuses on Nordic European and Anglo-Saxon countries.

2006, for evidence on the United States; Roine and Waldenström, 2008[52] for Sweden). In addition, even if this was not the case, the extent of avoidance (and evasion) at the top should have decreased much more than that of the rest of the population in order to exert an overall positive influence on the top shares.[53]

Thirdly, the country-specific top wage shares often closely follow the evolution of the overall top income shares. These results are inconsistent with the assumption that the evolution of inequality is entirely captured by the time-varying tax avoidance and evasion. Indeed, the tax on wages and salaries is usually withheld at the source so that it is almost impossible to escape the tax authorities' purview, compared to farm income or business income (Alvaredo, 2010; Banerjee and Piketty, 2005; Moriguchi and Saez, 2008).

Finally, work by Piketty, Saez, and Stantcheva (2012) developed and tested a model where the increase in top income shares can be linked to reduced tax progressivity mainly due to three motivations: increase in hours of work supplied (e.g., supply-side theory), increased rent seeking activity (e.g., a top executive having control of their salary has higher incentive to influence their remuneration and seize a greater share of the firm profits), and decreased tax avoidance. However, the elasticity of reported income to change in tax rates due to tax avoidance is considered the least important factor. Indeed, Piketty, Saez, and Stantchevea also point out that there are countries (such as Italy, Japan, Sweden, and the Netherlands) that experienced only modest increases in top shares despite significant top rate tax cuts of similar magnitude to what happened in Norway, Finland, and all advanced English-speaking countries.

In sum, there is little evidence to suggest that tax avoidance in relation to decreases in top marginal tax rates is a particularly relevant explanatory factor of the long-run surge in top income shares. Nonetheless, other types of changes in taxation regulations may well have substantial impact on top

---

[52]The authors suggest that it is possible that both the incentive to underreport from top individuals and the benefit and ability to monitor tax compliance by tax administration went up contemporaneously.

[53]A similar argument is used in Williamson and Lindert (1980).

shares. We differentiate below between those changes bringing about permanent shifts in income or temporary behavioral responses.

Both theory and empirical evidence highlight how tax avoidance (especially income shifting over time or across the tax base) can be of great relevance for short-term changes in reported income in order to exploit tax opportunities (Saez, Slemrod, and Giertz, 2011 provide a comprehensive survey of this literature as well as interesting empirical findings). The classic example discussed within the top incomes literature is the Tax Reform Act of 1986 (TRA86) which, among other things, dramatically lowered the top marginal tax rate on personal income, increased the capital gains tax rate, and, while lowering it, set the corporate income tax rate at a level higher than the top personal income tax rate. These policy changes provided strong incentive for agents to realize capital gains in the short-term, and to shift income from corporate to personal income (Slemrod, 1996; Gordon and Slemrod, 2000). It is worth noting that the shifting of business income from the corporate tax base to the individual tax base has brought about a permanent level shift for the top income shares in the United States if excluding capital gains. Following these law changes, the highest fractile share in total U.S. income (top .01 percent) grew by 30 percent from 1986 to 1987 (a year of a stock market crash) and by 53 percent from 1987 to 1988 (when a systemic banking crisis hit). However, as argued by Atkinson, Piketty, and Saez, the taxation policy change did not affect the series including capital gains[54] as "before TRA1986, small corporations retained earnings and profits accrued to shareholders as capital gains eventually realized and reported on individual tax returns. Therefore, income including capital gains does not display a discontinuity around TRA 1986" (note to Figure 5, 2011). Similarly the changes in taxation do not appear to have influenced the long-run trend of the shares.

There are also other less-discussed examples which may illustrate the full range of changes (and their complexity) in tax statistics we ought to take into account. For example, a substantial reduction of

---

[54]The only documented effect is an artificial spike in capital gains realizations in 1986 in anticipation of the announced increase in tax rate that took place in 1987.

marginal tax rates on dividends was obtained in Australia in 1987 through the introduction of the full imputation system (before the income from dividends was subjected to both corporate and income taxation).[55] Atkinson and Leigh (2007) note that "the effect of the introduction of imputation in Australia in 1987 is evident in the statistics." Indeed, the taxation regime change was announced in 1985 and had short-term impact on dividends distribution once the law was passed in 1987, consistent with optimal re-timing of income reporting. Moreover, it is also possible that the substantial reduction of the marginal tax rate on dividends may have induced more firms to distribute a greater share of their profits (changing the level of the shares).[56]

A switch to a full imputation system in 1993 had a long-lasting impact on the composition of top income shares in Finland (as documented in Jäntti et al., 2010).[57] A similar change was documented for New Zealand in 1989. However, in the same year a tax cut was announced to take place in 1990 (the top individual rate would have been reduced to the company tax rate) causing companies to postpone their payment to top executives. Moreover, "similar anticipation of tax changes is likely to have caused the sharp spike in top income shares is observed in 1998–99, and may have caused the 2000 figure to be depressed" as discussed in Atkinson and Leigh (2005).[58] Similarly, in 2005 Norway announced a

---

[55]The Australian dividends tax reform in 1987 increased the corporate profits tax rate from 46 to 49 percent, equalizing it to the top income marginal tax rate. However, as noted in Burkhauser, Hahn, and Wilkins (2013), "under the new 100 per cent imputation tax system contained in the reform legislation, these company taxes effectively became withholding taxes. This was the case since their payment could be used to offset personal income tax on dividends as well as other taxes."

[56]It is nonetheless important to note that, as argued in recent work by Burkhauser, Hahn, and Wilkins (2013), the changes in taxation regime have also brought about substantial permanent effects on reported income within top income brackets, although not through taxation avoidance. The previous section already discussed how the taxation reform expanded the personal income tax base through the inclusion of dividends and capital gains (possibly more gradually) which were previously unreported. Once these issues are appropriately taken into account, the real increasing trend of Australian top shares is slightly downsized, especially using the series including capital gains. Indeed, as discussed before it may be possible that the inclusion of capital gains within the personal tax base was only gradually increasing over time given the specific prescriptions of the taxation reform.

[57]The introduction of a dual taxation system which favoured capital income promoted the surge of dividends income to the expense of entrepreneurial income.

[58]The authors go on to state that when the government announced in 1998 that "the marginal tax rate on earnings over $60,000 would be raised from 33 percent to 39 percent in the 2000 tax year, many taxpayers took the

permanent increase in dividend tax (to be increased in 2006) and this marked a notable peak in top income shares as individuals and corporations shifted income over time to avoid the impending rate increase (Aaberge and Atkinson, 2008).[59]

4B.ii.e. Definition of Tax Units

Different country-specific series are based on different definitions of tax units. In some countries the unit of reference is the family (e.g., typically spouses with dependents or singles with no dependents). This is the case for the United States and most of the continental European countries. Other countries define their tax units based on individuals. This is the case, for example, for Australia, Canada, New Zealand, Japan, India, Italy, and Spain.[60]

Most importantly, some countries have experienced a change in the tax base as the taxation system moved from a family to an individual base. Fortunately, however, only the United Kingdom experienced such a shift within the period under analysis (the shift occurs in 1990).[61] Such a change in tax units can create comparison problems for at least two reasons.[62]

First of all, the level of top shares is affected and the direction and magnitude of such a change depends respectively on the joint distribution of income within families populating the top income

---

opportunity to realise business earnings in the 1999 tax year, significantly boosting top income shares in that year, and perhaps to a lesser extent also in the 1998 tax year."

[59]Aaeberge and Atkinson (2008: 13) also proposed a new set of estimates of Norwegian top shares by estimating the capital income from stock holding using a `Hicksian' approach. In other words they impute the returns from stocks by multiplying the "estimated market value of the households' stocks and the long-run average rate of return (8.9 per cent) on the Oslo Stock Exchange (OSE)" (p. 13). Moreover, they argue that "The "Hicksian" measurement of the stock returns is less sensitive to changes in income reporting behavior than the conventional income definition and may thus provide a better basis for analyzing the trend in top incomes during the pre- and post-reform period."

[60]The unit of analysis in New Zealand was based on family prior to 1953.

[61]Also Spain changed from family to individual taxation in 1988 but this was corrected within the original calculations of the series. See Alvaredo and Saez (2009). Other cases of changes in tax units occurred in the pre-1970 period are discussed within Chapter 8. In particular, the authors discuss the "borderline" case of Sweden in which, "the family was the tax unit before 1967 when a choice of filing individually was introduced. This was then the rule until individual taxation finally became compulsory in 1971" (p. 17).

[62]We do not discuss explicitly the change in the control total for the population which has to change accordingly to the definition of the tax units.

brackets and on the actual proportional difference between the number of individuals and the number of tax units as well as on the specific assumption about the Pareto coefficient.[63] As discussed in APS (2011), if the income for the richest families is unequally distributed (e.g. the head of the family concentrates most of the family income) we expect, under specific assumptions, the shift from family to individual unit to have a positive impact on the measured top income share series. The impact on the shares becomes negative if income is equally distributed within the top tax units. In the United Kingdom, for instance, the tax units increased from 33,000 to 46,000 in 1990 due to the change from family units to individual units and the top 1 percent series experienced an approximate positive jump of 1 percentage point as a result.

Second, and most importantly, a change in the composition of tax units may also affect the trend of the series, not just its level. Indeed, this happens if the factors influencing the level of the shares discussed above are also found to be time-varying. This is not implausible as, for example, income may have become more evenly distributed within richest families and the growth rate of tax units could have well exceeded the population growth over the past decades. Also, the change over time in the distribution of income at the top (formalized as the change of the Pareto-coefficient) has been thoroughly documented and discussed in APS (2011). Nonetheless, the available country-specific evidence (for Canada) shows that the use of different unit bases may affect the level of shares only (See Saez and Veall, 2005).

4B.ii.f. *Gross and Disposable Top Income Shares*

Gross income data can be complemented by information on government transfers and taxation to obtain measures of disparity in disposable incomes or spendable income, ultimately a preferable income definition for individuals. Indeed, the pre-tax top share can show a different picture than the post-tax share depending on the degree of progressivity of tax-system and the extent of redistribution. As discussed in the sections above, tax systems have changed a great deal over time for most of the countries discussed here, and have reduced their progressivity. These tax policy changes can influence the

[63] Atkinson and Harrison (1978: Chapter 9)

perception of economic inequality, and influence comparisons of inequality over time and across countries. Indeed, the incidence of taxation on net top income shares may vary across countries affecting the extent of comparability of top shares trends across countries.

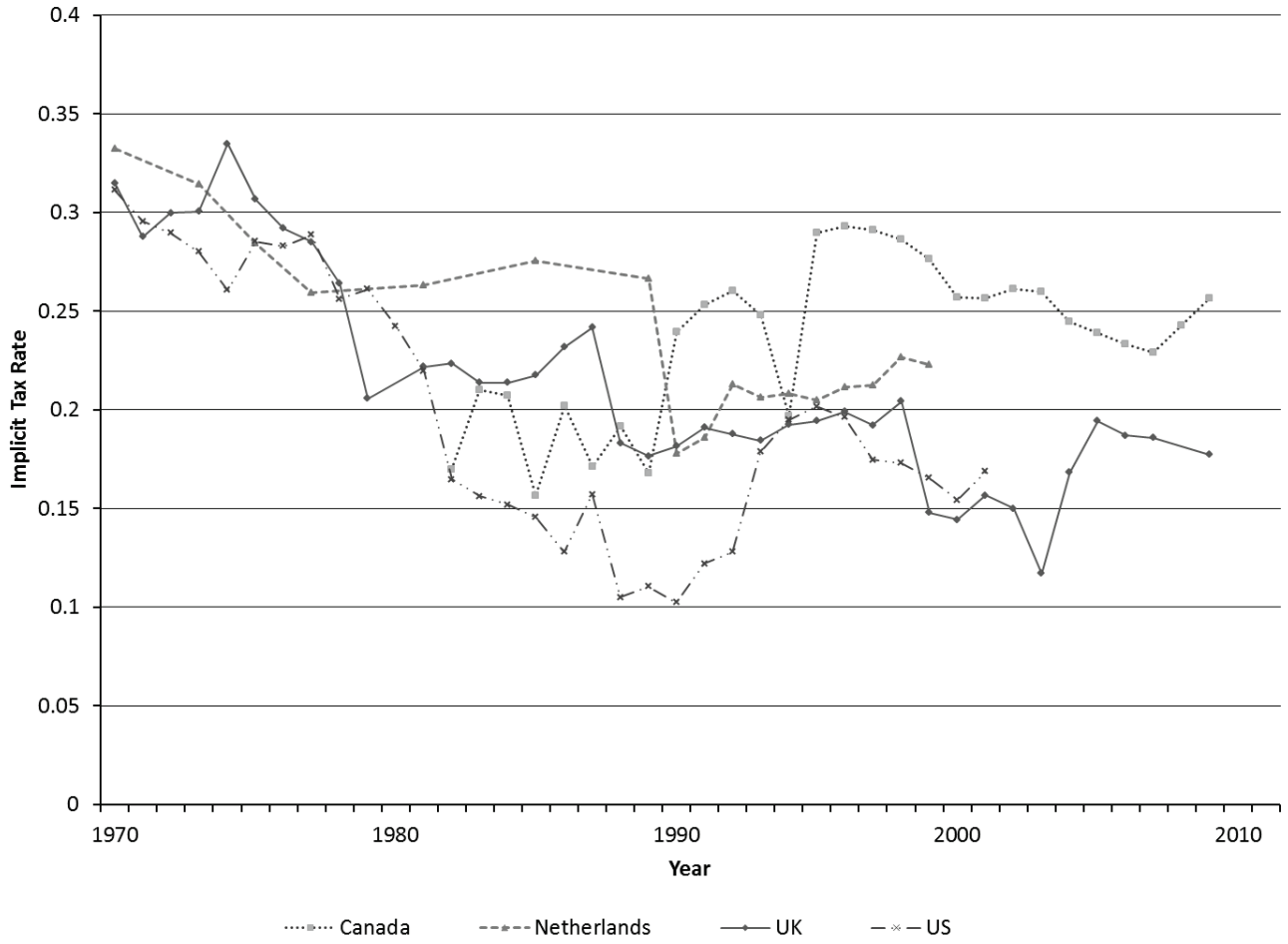
Data on disposable top income share are nonetheless available only for a handful of countries. In this section we describe the evidence for the Netherlands and the UK (Atkinson and Salverda, 2005), Canada (Veall, 2012), the United States and France (Piketty and Saez, 2006).

Although one should bear in mind that methodologies adopted by the above mentioned authors are not homogenous and income definitions are not directly comparable, it is interesting to obtain a measure of direct impact of taxation on top shares.

Following the work by Atkinson and Salverda (2005) we divide the before-tax income shares by the after-tax shares, in order to measure the so called "relative implicit tax rate." We define the latter as the "arithmetic impact of taxation" on top shares calculated as [1- (before-tax share)/(post-tax share)] which in turn is equal to [1-(1-average tax rate at the top)/(1-average tax rate for the overall population)]. Figure 22 depicts the "implicit tax rate" for Canada, the Netherlands, the United States, and the United Kingdom[64] showing that the tax system reduced its progressivity in these countries with the exception of Canada. For the United Kingdom, United States, and the Netherlands the inversed implicit tax rate for the top 1 percent went from around 35 percent in 1970 to around 20 percent in 2000. However, the implicit tax rate in United States fell more during the 1980s reaching the value of 10 percent in 1990 before rebounding to around 20 percent. In Canada the pattern was nearly reversed. The Canadian implicit tax rate was on average lower than 20 percent during the 1980s, it then increased by ten percentage points during the 1990s and finally declined gradually to a value of around 25 percent. This is the reason why

[64]France has only two observations, one in 1970 and one in 2005, which are not shown in the graph. The implicit tax rate calculated on French top 1 percent share is relatively mild and it marginally increased over time—from 0.08 in 1970 to 0.1 in 2005 (results are based on calculations on data taken from Piketty and Saez, 2006). In other words the net-of-taxes top 1 percent share is found to be approximately 8 percent and 10 percent lower than the gross share, respectively in 1970 and 2005). We remind here that the calculated implicit tax rates are not directly comparable across countries.

Figure 22. Implicit Tax Rates for a Selected Group of Countries



Sources: Calculation of the authors based on data from country specific literature: UK and New Zealand (Atkinson and Salverda, 2005), Canada (Veall, 2012), the United States and France (Piketty and Saez, 2006).
Notes: the figure shows the dynamics of the "relative implicit tax rate" from 1970 for the United States, United Kingdom, Canada, and New Zealand. The implicit tax rate represents the "arithmetic impact of taxation" on top shares and it is calculated as
[1- (before-tax share)/(post-tax share)] which in turn is equal to [1-(1-average tax rate at the top)/(1-average tax rate for the overall population)].

net top income share would show an attenuated increase in inequality in Canada as shown in Figure 23. In the United States and the United Kingdom, however, pre and post-tax trends in the top 1 percent share are essentially indistinguishable.

4B.iii. Top Shares in the Late 2000s

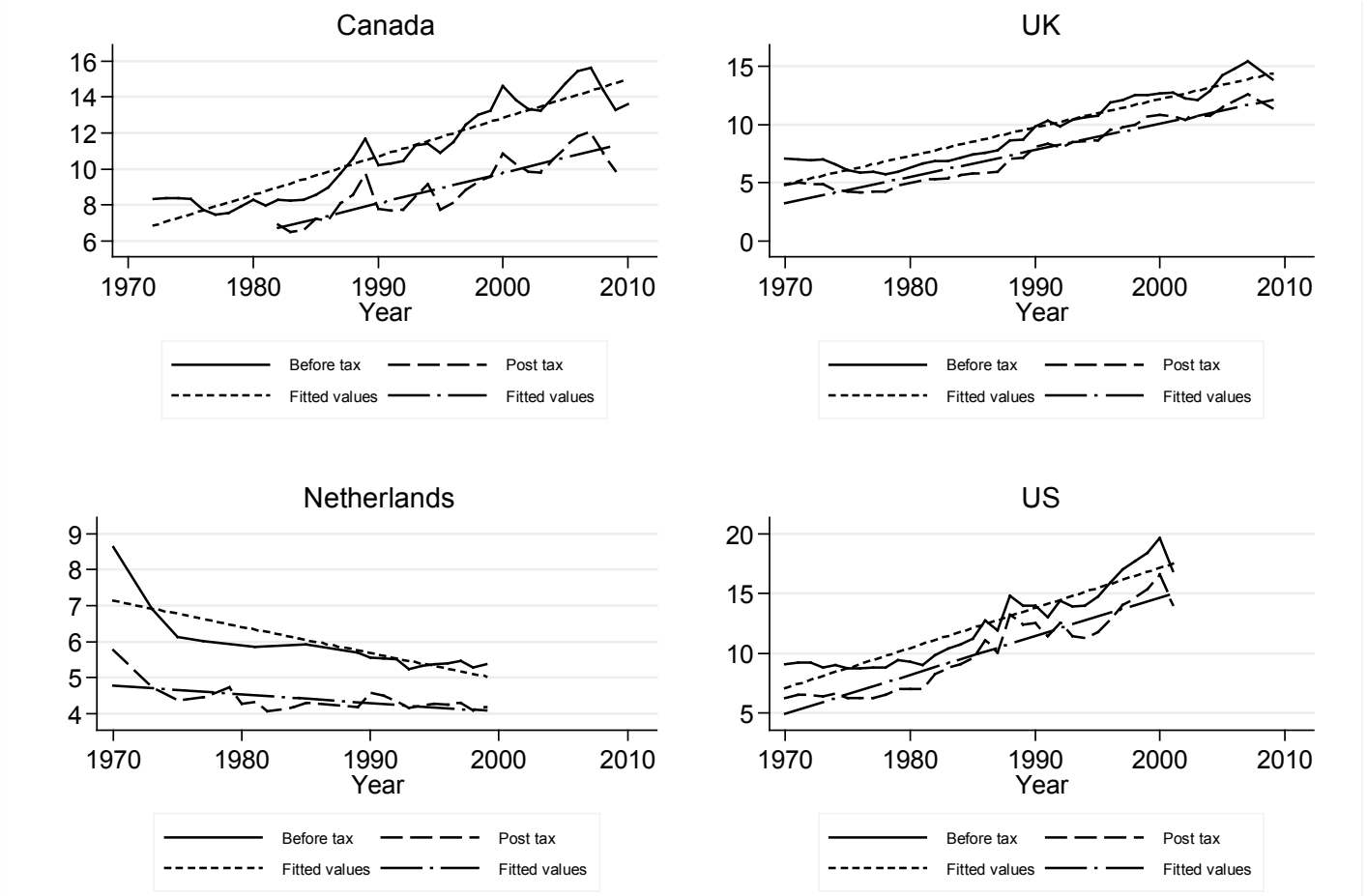
The WTID contains information for top income shares in 25 countries. In addition to all of the caveats described above, making comparisons across the countries is limited to the years of data that are available. Nineteen of those countries, though, do have data during the "late-2000s" (2009, 2010, or 2011) and several more have at least some data for the period of the "mid-2000s" (2003–2008). Such data for mid-2000s and late-2000s top 1 percent shares are represented in Figure 24. Comparisons of the level of inequality using these top share figures across countries may be problematic for all of the reasons discussed above. Differences in definitions of income and income reporting units, as well as tax treatment of different types of income, and potential differences in tax reporting, avoidance, and evasion can all influence differences in the levels of top income shares over time.

These caveats notwithstanding, it is interesting to notice that the ranking of countries based on top income shares remains very similar to what was observed using the inequality measures across in the entire distribution (based on data comparable across countries) in Section 4A. Among rich countries, the English-speaking countries have higher measured inequality than the Nordic counties. In 2010 the top 1 percent share was nearly 18 percent in the United States and less than 7 percent in Sweden and Denmark. Among the middle-income and developing countries under investigation within the chapter and for which we have data, South Africa has the highest levels of inequality.

4B.iv. Comparison of Trends across Country Groups

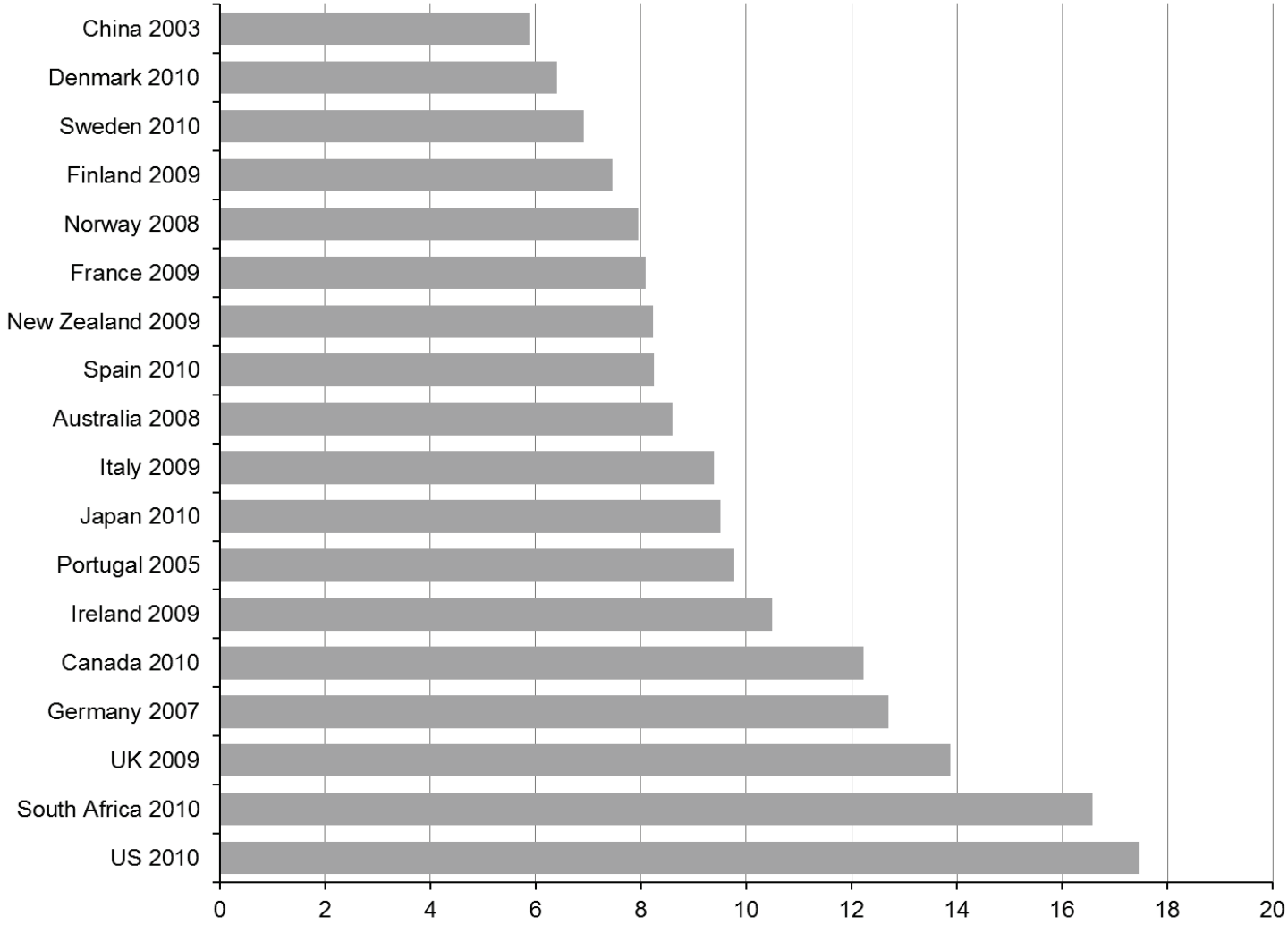
The primary goal of this section is to explore commonalities and differences in trends across countries in our data from 1970 to 2010. Previous sections emphasized how different sources, methods, and definitions of income tax may affect the estimated top shares across countries. However, we have also shown that not all changes in methodology or breaks in data series create comparability problems.

Figure 23. Pre and Post-Tax Top 1 Percent Shares for Selected Countries



Sources: Elaboration of the authors based on data from country specific literature: UK and New Zealand (Atkinson and Salverda, 2005), Canada (Veall, 2012), the United States and France (Piketty and Saez, 2006).
Notes: The graph shows both the top 1 percent based on gross income (net of taxes and of transfers) as well as on net income for the case of Canada, New Zealand, the United Kingdom, and the United States.

Figure 24. Top 1 Percent Shares in Late 2000s



Source: Data from the World Top Income Database - WTID (accessed on September 2013).

As noted in Gottschalk and Smeeding (2000), the time varying and time invariant factors specific to the shares need to be the same across countries in order to have meaningful cross-countries comparisons. In order to ease the exploration of differences in trends, we ignore factors which are country-specific and time-invariant, namely the differences in levels. More precisely, we standardize the values of the shares to be equal to 100 in 1980. Due to data availability, the standardization to 100 is done for the year 1990 for emerging countries. This would take care of measurement errors and heterogeneity of methodology of calculation of top shares across countries that are constant over time.

We group the countries in our dataset into the following clusters: Nordic European (Denmark, Finland, Norway, and Sweden), Southern European (Italy, Portugal, and Spain), Western English speaking (Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States), and Continental European countries (France, Germany, Netherlands, and Switzerland) together with Japan. The remaining countries, China, India, and South Africa, are labeled as emerging or Middle Income countries. These clusters differ somewhat from the previous section discussing inequality across the entire distribution, but are consistent with the groupings used in APS (2011). According to APS (2011), these groupings are "made not only on cultural or geographical proximity but also on proximity of the historical evolution of top income shares" (APS, 2011: 40).

The various panels in Figure 25 show that top income shares are rising in many countries—increasing inequality is not limited to a small number of countries or any obvious subset of countries. Indeed, a common pattern observed across most of the countries in the WTID sees declining top shares for one or two decades since 1970 followed by steadily rising top shares through 2010. The precise timing and extent of the "U turn" in top shares varies across countries and we provide below a description of the main features of the dynamics of top shares over time across different country groups.

All of the Southern European countries have seen a rising top 1 percent share since 1980, but the increase has been much sharper in Portugal, where the top share more than doubled between 1980 and 2010, compared to an increase of "only" 40 percent in Italy and approximately 15 percent in Spain (Panel A). Trends in the top shares of Continental European countries (Panel B) fluctuate more with business

Figure 25. Top 1 Percent Share Trends—by Country Group—1970 to 2010

Panel A. Southern Europe (1980=100)

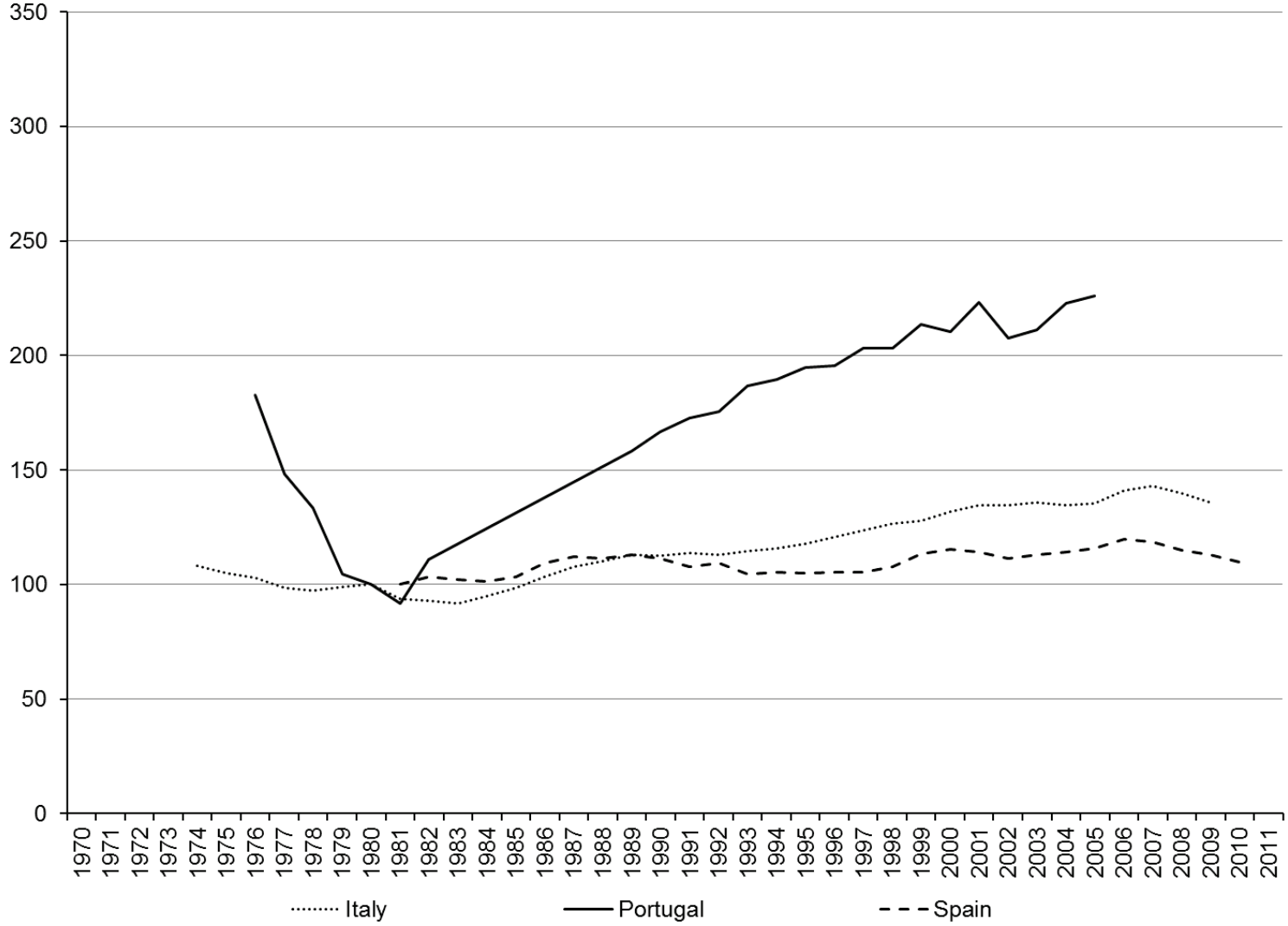


Figure 25, continued

Panel B. Continental Europe and Japan (1980=100)

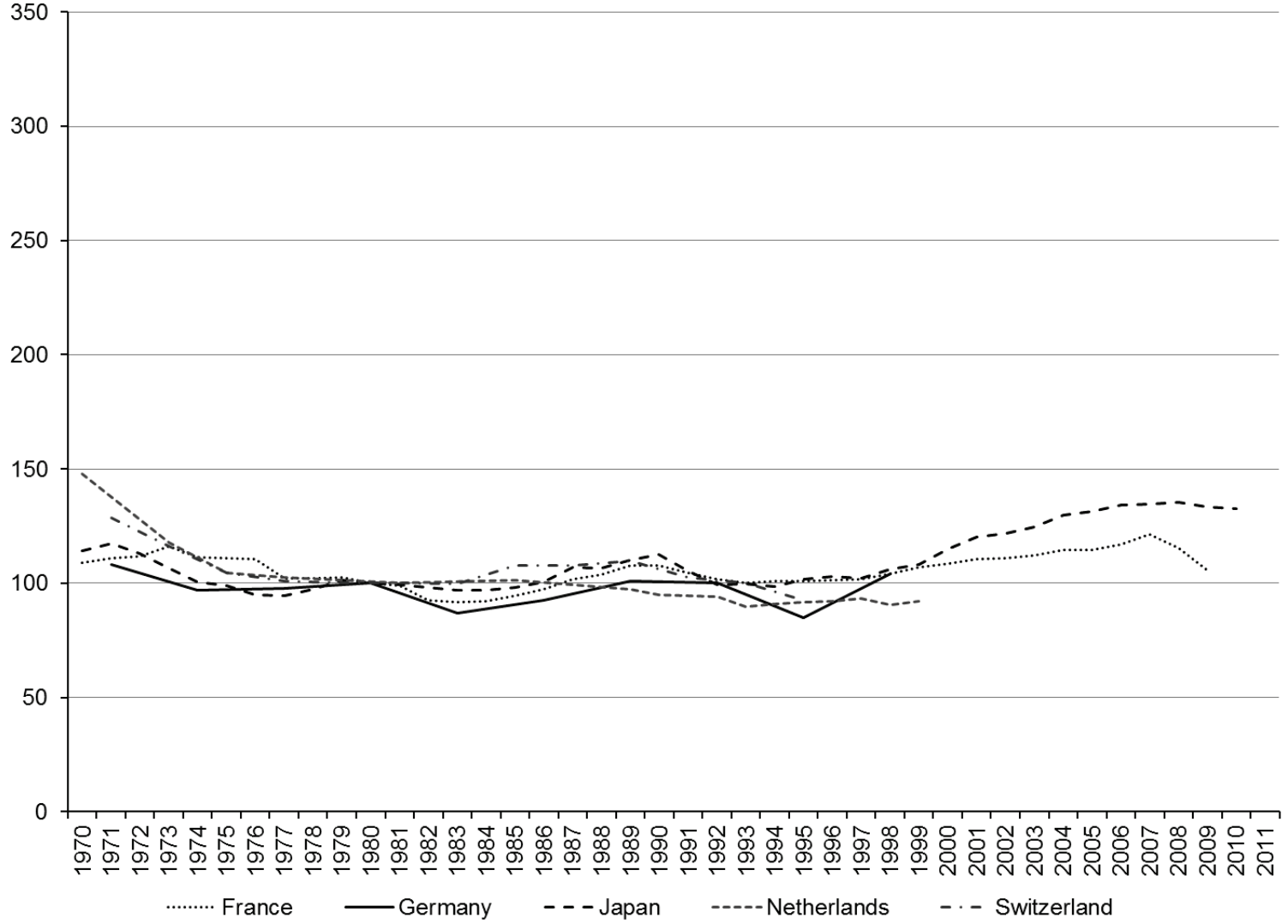


Figure 25, continued

Panel C. English Speaking (1980=100)

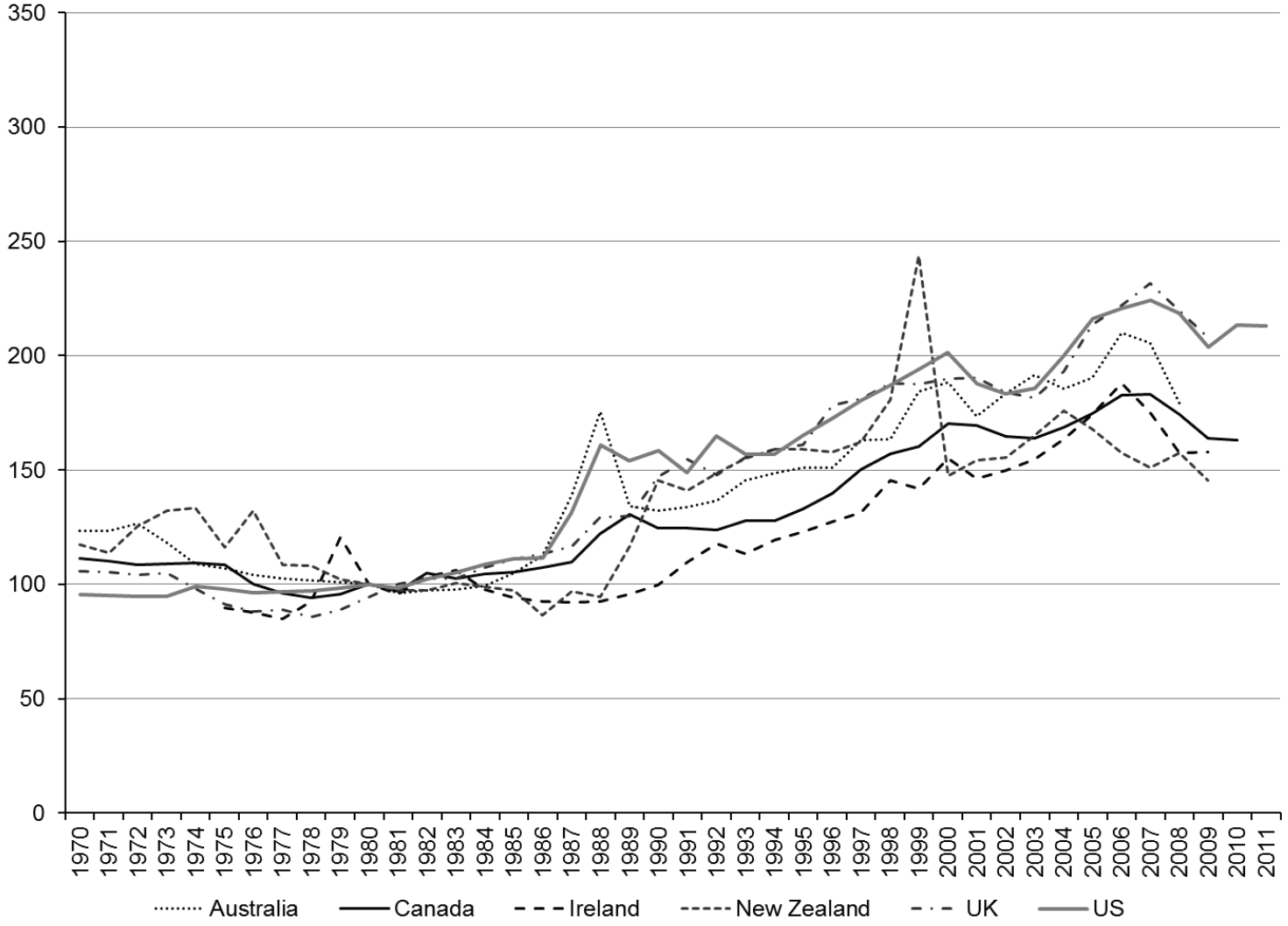


Figure 25, continued

Panel D. Nordic (1980=100)

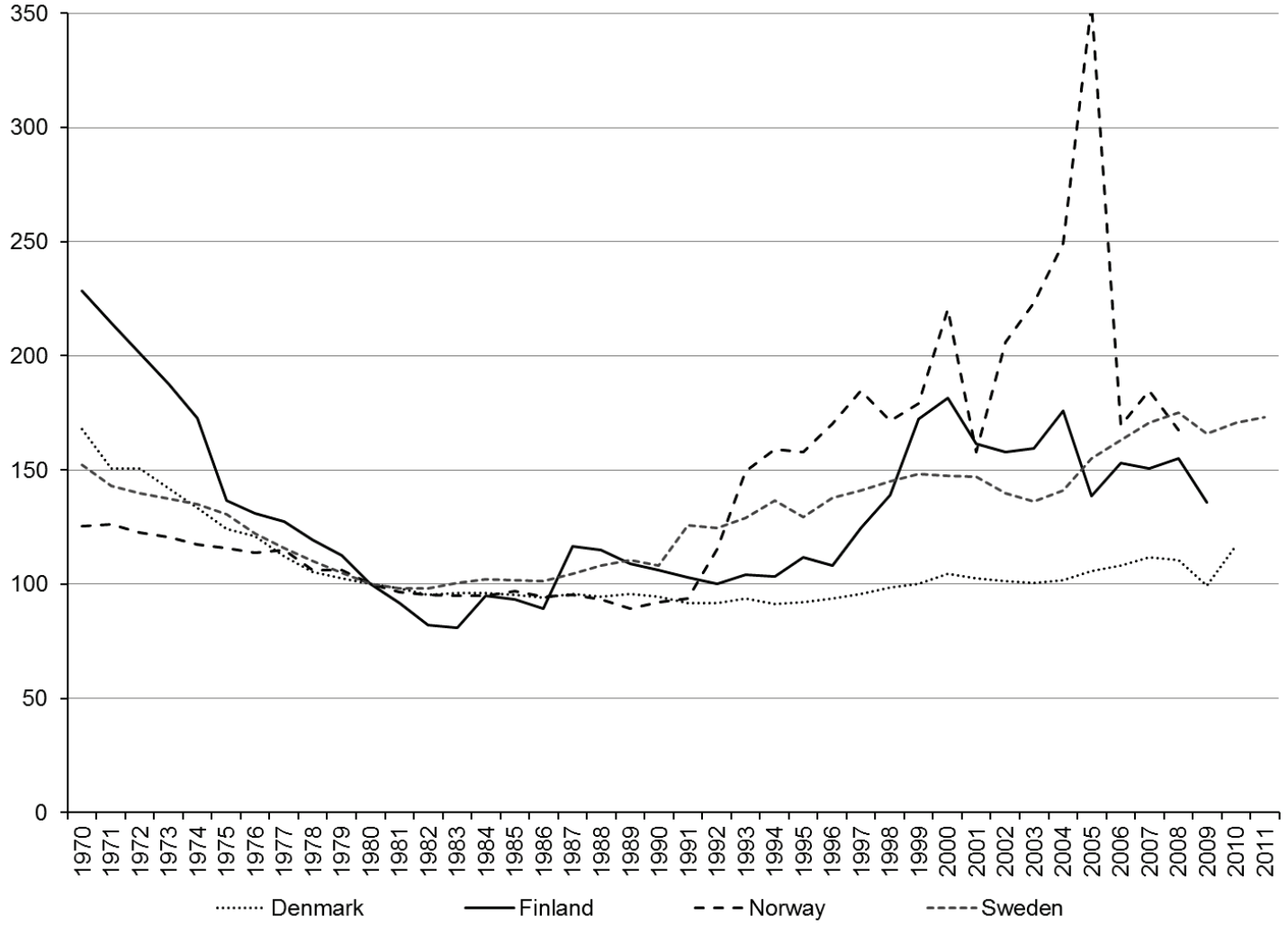
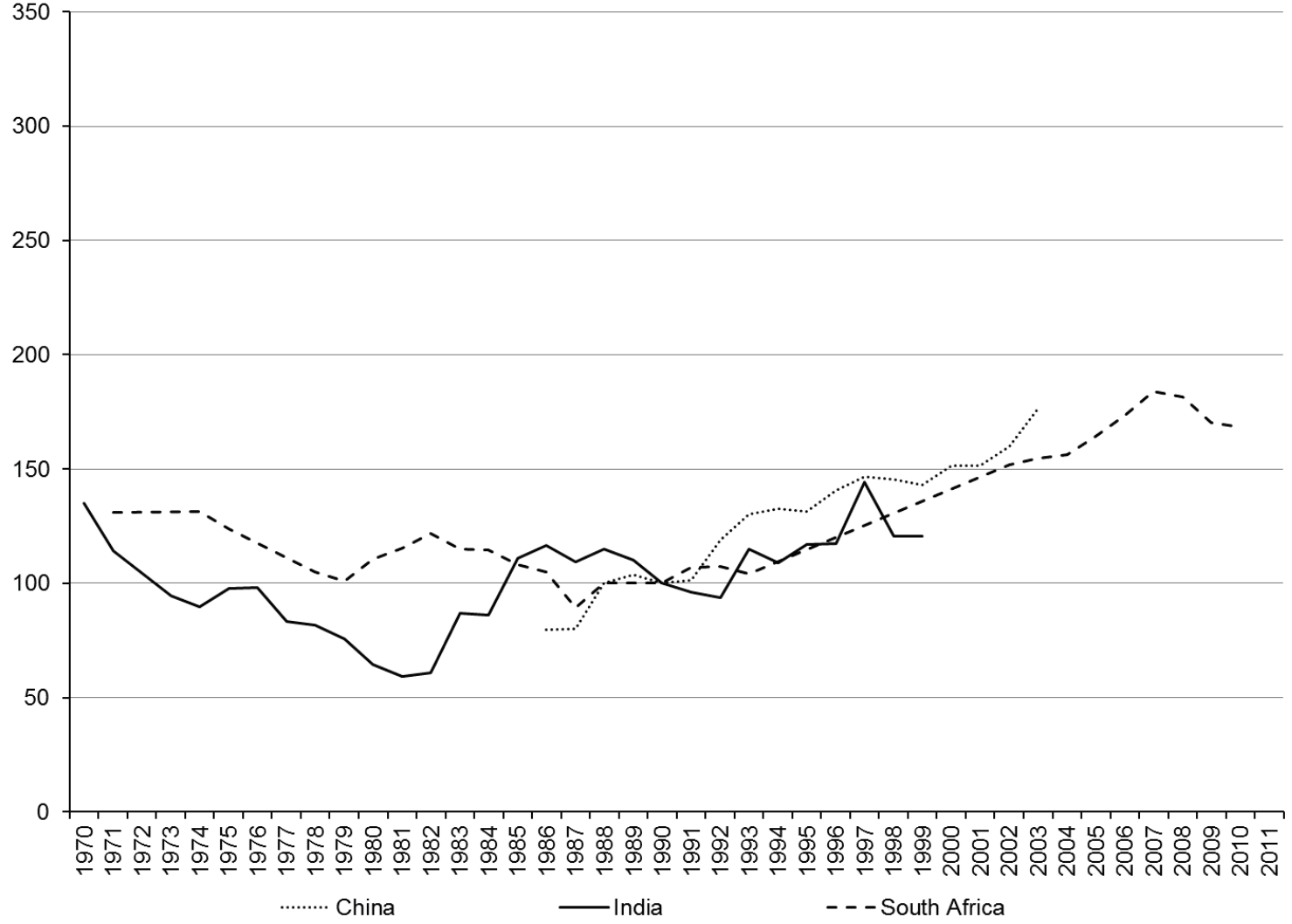


Figure 25, continued

Panel E. Developing (1990=100)



Source: World Top Income Database: accessed on September 2013. Elaboration by the authors.

cycle patterns than the Southern European countries. Nonetheless, the pattern of top shares series remains broadly consistent with a mild "U" shape, as the top 1 percent share fell between 1970 and the early 1980s and it remained more or less stable until the mid-1990s when it mildly rebounded till the onset of 2007–2008 financial crisis. In fact, most of the Continental European countries lack top share data over the last decade, making a complete analysis of this period impossible at present. France and Japan are the two countries in this group with data over the full period, and they both follow this pattern closely. Between the mid-1990s and mid-2000s, the top share rose approximately 30 percent in Japan and 15 percent in France. Between 2007 and 2010 top shares held steady in Japan, but declined sharply in France.

Top shares in the English-speaking countries have also fluctuated with the business cycles, but exhibit a clearer upward trend than the Continental European countries since the early or mid-1980s (Panel C). Moreover, all English speaking countries with the exception of New Zealand[65] experienced a very similar trend since the end of the 1980s.[66] Between 1990 and the onset of the 2007 financial crisis the top 1 percent share rose between 60 and 70 percent (In Australia, Canada, the United Kingdom, and the United States) and around 90 percent (in Ireland). Trends in the English-speaking countries show some evidence of the impact of the economic crisis, with declining top shares between 2007 and 2010–11.

In the Nordic countries, top shares were mostly flat during the 1980s, and did not start rising until 1990 or later (Panel D). This is particularly clear in the case of Norway, where the top 1 percent share was unchanged between 1980 and 1990, but doubled between 1990 and 2000. Post-1990 increases were smaller in the other Nordic countries, especially Denmark, where the top income share only rose 15

---

[65]Evidence for New Zealand suggests that the top 1 percent share increased by 50 percent from 1980 to the onset of recent crisis, only accounting for the change in reported income driven by the switch to the full imputation system in 1989 as detailed in the text above. Once we ignore this permanent jump in reported income (and the subsequent temporary spike in 1998–99 due to income shifting over time), the trend for New Zealand's top share is almost flat. This was already noticed in Atkinson and Leigh (2005).

[66]This allows netting out some of the structural effect induced by changes in taxation system as discussed before.

percent between the late 1980s and the late 1990s, before sliding back down in the late 1990s and early 2000s. The post-1990 trend in rising top shares appears to have been halted or reversed by 2000 in Finland and by the mid-2000s in Norway, although in Sweden the rising top shares trend continued. As discussed earlier, the unusually large spike Norway's top 1 percent share in 2005 is attributable to dividends paid out in anticipation of tax policy changes in 2006.

In the developing countries in the WTID, the trends in top shares seem to resemble most closely those in the English-speaking countries. Top shares started rising in the early 1980s in India and in the late 1980s in China and South Africa (Panel E). Post-1990s these three developing countries appear to experience a long-term rising trend in the top 1 percent share of income.

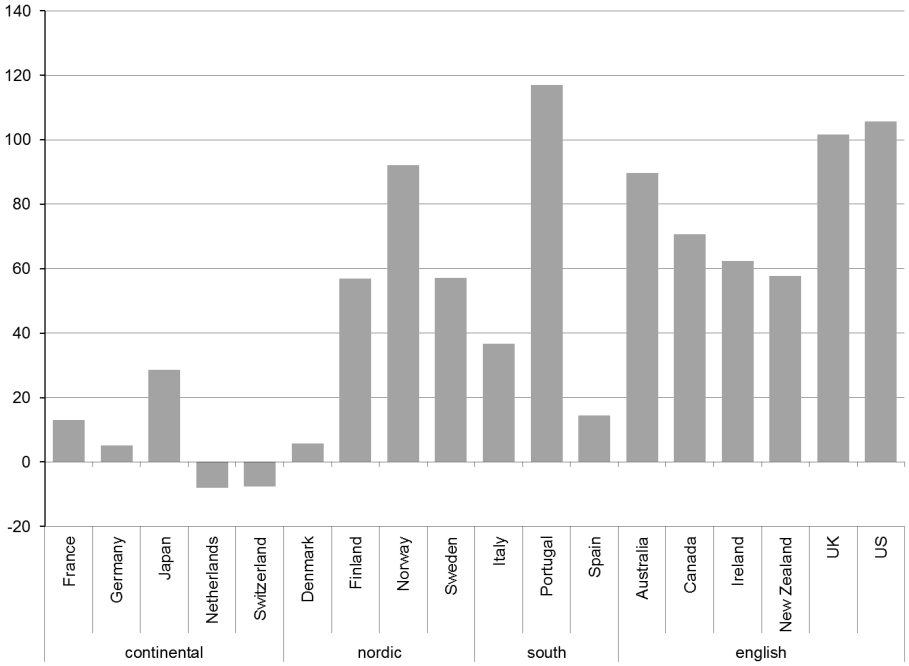
Between 1980 and 2009–2011, top shares more than doubled in the United States and the United Kingdom, and were on track to double in Australia and Ireland before falling sharply in the global economic downturn which hit most developed countries beginning in 2007/2008. The English-speaking countries stand out as experiencing the largest increases in top shares over the entire post-1980 period, and account for three of the top five countries with the largest cumulative changes in top 1 percent share between 1980 and the post-2000 average (Figure 26, Panel A). However, much of the run-up in top shares in English-speaking countries occurred in the 1980s. Focusing on changes in top shares since 1990, a different set of countries stands out as having large increases. The four countries with the largest cumulative changes in the top 1 percent share since 1990 include two Nordic countries (Finland and Norway) and two developing countries (China and South Africa) (Panel B). Post-1990 cumulative increases in top shares were roughly equal between English-speaking and developing countries. It is important to note that the results are invariant to the exclusion of the abnormal spike in the top income share that occurred in Norway largely due to the anticipated change in taxes on dividends.[67]

---

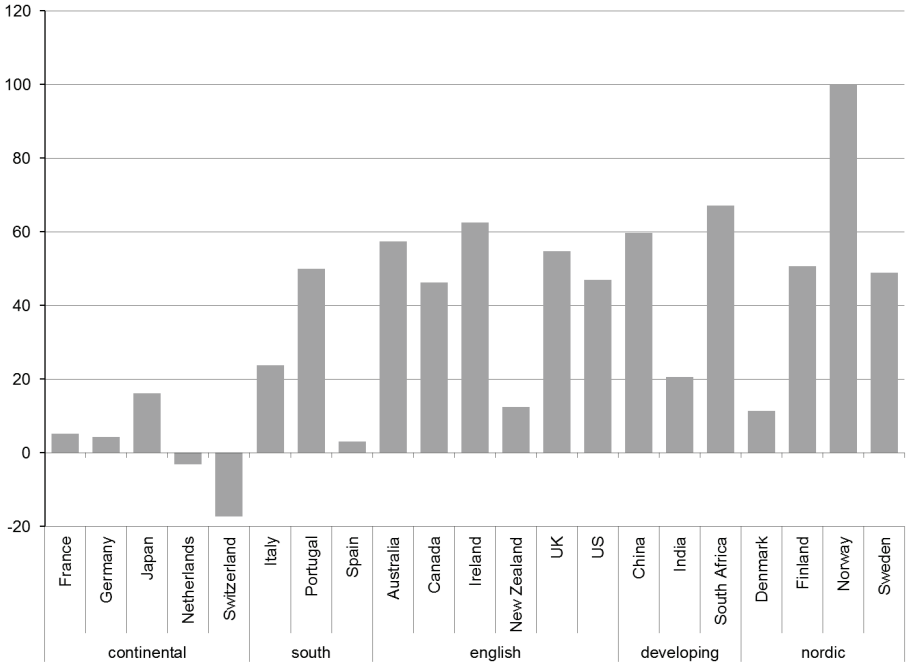
[67]As mentioned before, in 2005 Norway announced a permanent increase in dividend tax (to be increased in 2006) and this marked a notable peak in top income shares as individuals and corporations shifted income over time to avoid the impending rate increase (Atkinson and Aaberge, 2008).

Figure 26. Cumulative Changes in Top Income Shares by Country and Country Group

Panel A. Cumulated change from 1980 to post-2000 average



Panel B. Cumulated change from 1990 to post-2000 average



Source: World Top Income Database: accessed on September 2013. Elaboration by the authors.
Note: Data are sorted by the average cumulative change in the top 1 percent by country groups. In the case of Germany we draw information from top share including capital gains. The cumulated change is computed since 1990 for the developing countries. Due to lack of information the post-2000 period is equivalent to 1995 for Switzerland and to 1999 for India and the Netherlands. Results are obtained excluding the Norway's top 1 percent peak in 2004 and 2005.

The various panels in Figure 25 track the decline in top income shares in the decade or two, depending on the country, after 1970, followed by rising top shares starting around 1980 or 1990, again depending on the country. Whether these long-term trends will persist into the future is an open question. Most of the countries in the WTID did witness falling top shares between 2007 and 2010, but many of the countries lack data during these years. Have long-term trends toward rising inequality been reversed by this period of financial turmoil and recession? Or, can they be expected to revert to their pre-2007 trends? Morelli (2013a) uses the WTID together with a novel database on banking crises and macroeconomic shocks to answer this question by estimating impulse response functions of top shares to the occurrence of the shocks. Among other things and excluding developing countries, his results suggest that the short-term impact of systemic banking crises on the upper income brackets of the income distribution is negative at the very top of the income distribution (e.g. above 99th percentile) and positive at the bottom of the top decile (e.g. between the 90th and the 99th percentile). In other words, the relative response to systemic banking shocks differs across top income groups given their heterogeneous nature.

However, and most importantly, systemic banking crises don't seem to substantially affect top income shares as their estimated dynamic responses are found to be relatively small in magnitude.[68] Similar evidence on the U.S. top income shares confirm these findings and provides further evidence suggesting that the impact of crises may also be temporary in nature as top income shares may quickly return to their predicted path in the absence of a crisis (Morelli, 2013b).

Consistent with what was informally documented and suggested in APS (2011), Saez (2012, 2013), and Piketty and Saez (2012), these results suggest that even major disruptive crises like the 2007/2008 financial turmoil may not represent a structural break for top shares series and we should not expect a reversal of the increasing trend in income concentration unless some strong change in the

[68]Indeed, the estimated crisis impacts are generally found to be substantially below one standard deviation, irrespective of the specific top share or country group under investigation.

political and institutional framework is expected to happen (e.g., a change in taxation regime, remuneration practices, regulation policies, etc.).

4B.v. Income Decomposition

In the sections above we have described the increasing trends of top income shares for most of the countries. What is driving these trends? To better understand the mechanisms that led to an increase in inequality in most of the countries under investigation we can use composition data from the income tax statistics. However, income decomposition by sources is only available for a few countries. Ideally, we would like to understand how both marginal distributions of each source of income as well as their joint distribution affect the dynamics of the right tail of the income distribution. This is discussed in Atkinson, Piketty, and Saez (2011) and subsequently in Alvaredo, Atkinson, Piketty, and Saez (2013) in the case of the United States for two sources of income, namely wage and capital. Their results suggest an increasing association between the two sources of income for individuals within top brackets. However, understanding this important issue (which requires the availability of micro data for every country and year) goes well beyond the scope of this chapter. A less rigorous approach is to simply decompose the top income into, say, two main sources (wage and capital income) in order to understand their incidence in total income accruing to the top.

Below we depict the share of capital income (including rental income from buildings, interest income, and dividends but excluding realized capital gains where possible) and employment income (wages, salaries, bonuses, allowances, and pensions) for those eight countries where these calculations are possible (Australia, Canada, France, Japan, Italy, Netherlands, Spain, and the United States). On balance, wage income weighs substantially more within the total top income above the 99^{th} percentile (top 1 percent). This holds true with the exception of Italy and Australia where wage income has a relatively

lower incidence on the total (Figure 26).[69] The picture is reversed if we look at richer top income brackets above the 99.99th percentile (top 0.01 percent). Here, capital income incidence is generally higher than earned income (the only exceptions are Canada and the United States).[70] Results are shown in (Figure 27).

The relative shares of different sources of income accruing to the top have also changed over time and the experience has been heterogeneous across countries. In the case of top 1 percent shares, on balance, there is evidence of a slight increase over time in the labor-type income share for the countries for which income composition data are available (Panel A). The main exceptions are Spain and Australia, which have exhibited falling wage shares since the late 1990s until the mid-2000s.[71] In Japan and the United States, wage shares increased slightly prior to 1990, but they have remained roughly constant since. And, in other countries, including France and Italy, there is little evidence of any trend in wage shares. The clearest cases with rising wage shares are the Netherlands post-1990 and Canada post-1980.

The evidence of an increase in top wages income is less clear cut for the case of top 0.01 percent shares (Panel B). Wage income visibly increased over time for Italy, Canada, and the United States (until around 2000, after which there was a marked reversal). The wage income share was relatively stable in Australia and France.

---

[69]Australian data can only be decomposed in wage and non-wage income. The latter represents our definition of "capital" income and includes realized capital gains as well as business income (self-employed income, profits from unincorporated business and farm income).

[70]Recall that realized capital gains are not included in the standard top income shares under analysis.

[71]It is important to note that Spanish data include capital gains within the definition of capital income. This explains the more acyclical nature of wage shares which recovered substantially in Spain in the late 2000s and a similar but milder trend appears to be true for Australia. It is also important to notice that Australia remains the only country where the incidence of capital income within the top 1 percent group is higher than the wage share. This is due to two main reasons. First of all, business income is entirely included within the "non-wage" income. Secondly, Australian data incorporates capital gains to the extent that they are taxable (at varying degrees over time). Indeed as recalled in Burkhauser, Hahn, and Wilkins (2013), "Prior to 1985, Australia had no general tax on capital gains. Hence, almost no capital gains were captured in tax record data, since most capital gains were excluded from the personal income tax base. It was not until 1972 that realized capital gains on most assets were included in the tax base under Section 26AAA of the tax law, but only for short-term capital gains (those on assets held less than one year), and excluding owner-occupied housing. While a tax on realized capital gains on assets based on speculation existed as far back as the 1920s, it was not systematically enforced and it generated little revenue" (p. 8).

Figure 27. Labor and Capital Compositions of Top Incomes

Panel A. Income Composition of the Top 1 Percent Group

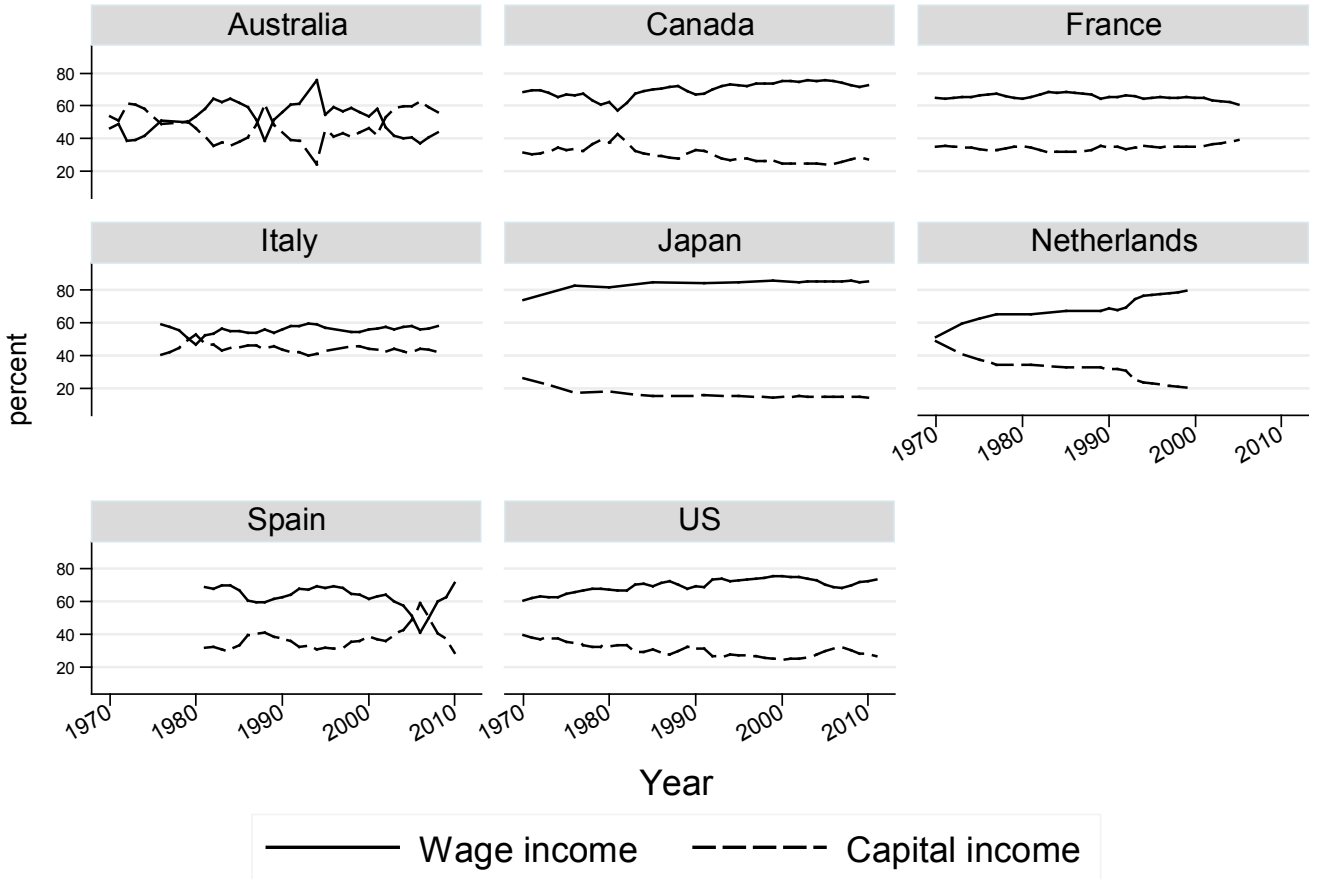
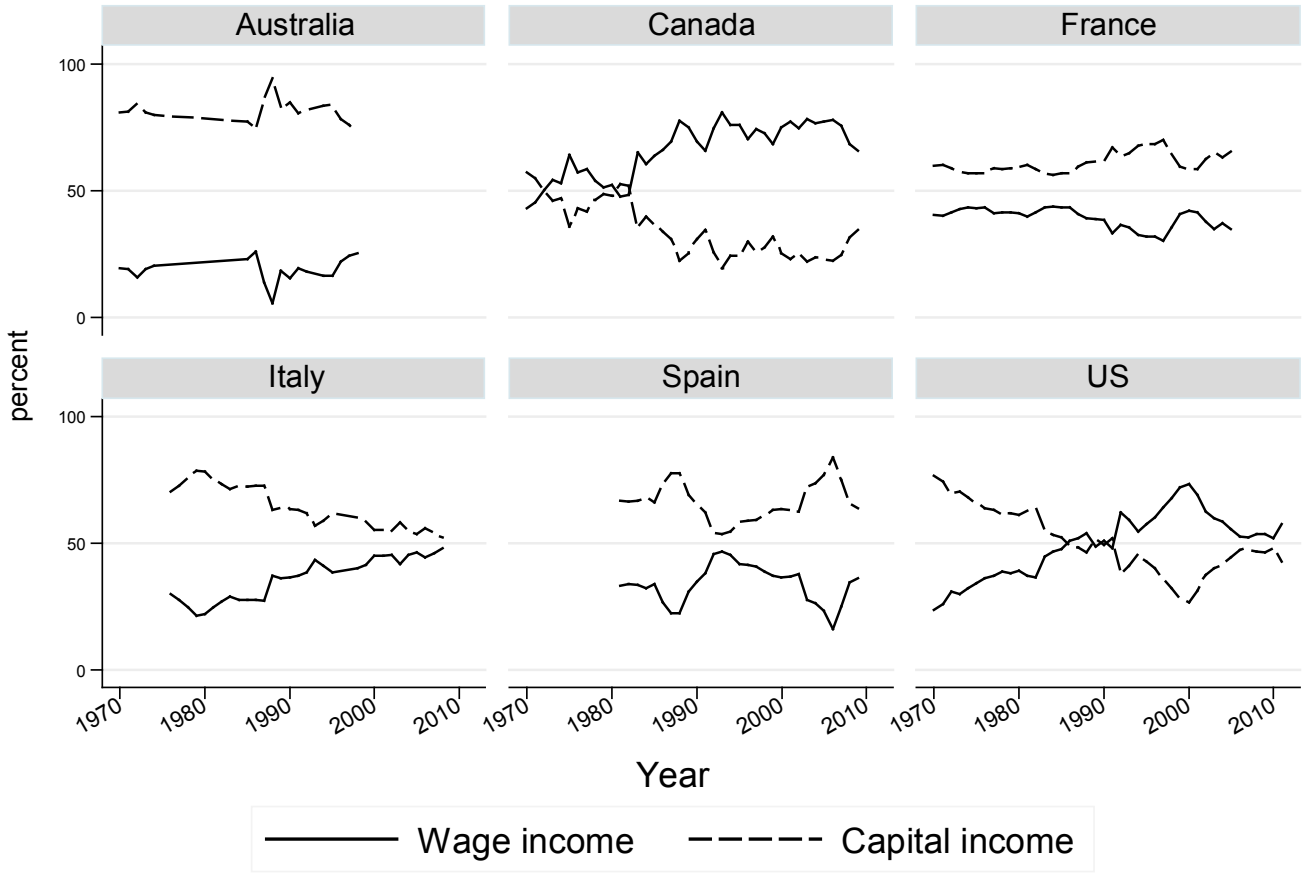


Figure 27, continued

Panel B. Income Composition of Top 0.01 Percent Group



Source: World Top Income Database: accessed on September 2013. Elaboration by the authors.

Notes: The graph depicts the incidence of different sources on total income accruing to the top 0.01 Percent. In particular the graph shows the share of capital income (including rental income from and buildings, interest income and dividends but excluding realized capital gains where possible) and employment income (wages, salaries, bonuses, allowances, and pensions) for those eight countries where these calculations are possible (Australia, Canada, France, Japan, Italy, Netherlands, Spain, and the United States). Note that Australian and Spanish data include realized capital gains to the extent they are taxable. Moreover, Australian data can only be decomposed in wage and non-wage income ("capital" income including realized capital gains as well as business income, self-employed income, profits from unincorporated business and farm income).

It is nonetheless very important to bear in mind that definitions of income sources are not necessarily comparable across countries and that different tax systems within different countries may incentivize the income reporting of the specific income source with greater fiscal convenience (see section about fiscal avoidance). It is therefore not always clear how one should interpret the documented percentage incidence of wage and capital incomes within top brackets. The results discussed within this section abstract from these important issues.

4B.vi. Bridging the Gap between Tax Statistics and Survey Data: Gini vs. Top Share

In the second section of this chapter we explored the dynamics of overall income inequality using a variety of summary statistics, including Gini coefficients, decile ratios, and others. These variables are usually constructed from household surveys. Some countries are, however, increasingly resorting to register data (like Scandinavian countries) or to a combination of both survey and register data (like the United Kingdom and France since 2008) trying to overcome standard household survey limitations.

Indeed, household surveys are not typically stratified by income, and partly as a result suffer limitations which are particularly pernicious for top income groups (measurement errors, non-response, or incomplete response) and often adopt a top coding methodology which limit by construction the information on the right tail of income distribution.[72] These limitations frequently make it impossible to get robust quantitative evidence about the incomes of individuals at the very top of the distribution.[73]

---

[72]There are usually two levels of top-coding. The first level guarantees the secrecy of data while the second (present even within the data exclusively available internally to statistical agencies) serves to avoid outliers having an influence on the aggregate statistics.

[73]This has been pointed out in Brewer et al. (2008) for the case of the United Kingdom where the statistical office usually adjusts the measure of income accruing to the very rich individuals detected within the Family Resources Survey (FRS) using the data provided within the Survey of Personal Income (SPI). The latter in turn samples information on income from the tax administrative data of the HMRC and oversamples by design the information on rich individuals. Similarly, Moriguchi and Saez (2008), discuss the limitation of the National Survey of Family income and Expenditure (NSFIE), which collects a representative sample of about 10,000 households and because it "contains few observations at the high end of income distribution, it is difficult to provide precise estimates for the top 0.5% income group and above using NSFIE data."

On the other hand, top income shares are constructed from tax administrative micro data or grouped tabulations and are particularly suitable to estimate the right tail of the income distribution. Nonetheless they provide less-compelling information about the bottom of the distribution.

Are these two different sources providing substitutable or complementary information? In other words, are top income shares to be combined with survey data in order to have a more complete picture of economic inequality within a country? Or do top shares embed sufficient information to proxy the distribution of income as a whole? In what follows we discuss these important questions individually.

4B.vii. Top Income Shares as Complementary to Household Survey Data?

Work by Burkhauser, Feng, Jenkins, and Larrimore. (2012) has compared the evolution of the U.S. top income shares calculated in survey data (CPS data from internal sources) to that provided by Piketty and Saez (2006) using administrative tax data (IRS).[74] Burkhauser, Feng, Jenkins, and Larrimore. (2012) suggest that CPS-based top shares track closely with the tax-based top shares up to the 99th percentile. Importantly, the comparison is carried out taking into account the same unit of reference (tax units) and similar income definition adopted in Piketty and Saez (2006). However, the U.S. top 1 percent, as estimated by Burkhauser, Feng, Jenkins, and Larrimore (2012), does not track the top 1 percent as obtained in Piketty and Saez (2006) with the same precision. This appears even more evident once capital gains are included within the income definition[75] as noted by APS (2011). Indeed, as shown before, capital gains are an important component of income at the top which could influence substantially both the level and the trend of income inequality. In addition, including capital gains arguably provides a more economically meaningful measure of income dispersion.[76]

---

[74]The internal CPS files contain better coverage of top incomes, specifically non top-coded income levels, than the publicly available CPS.

[75]The CPS does not record capital gains. In addition, CPS data also exclude information on stock-option gains which are instead recorded within IRS taxation data.

[76]Moreover, the series including capital gains is less sensitive to changes in tax avoidance around TRA 1986. Indeed, as we discussed previously, the TRA 86 mostly incentivised "a shift from corporate income toward

Atkinson, Piketty, and Saez (2011) also provide a tentative adjustment of official CPS Gini coefficients, taking into consideration the differentials in top 1 percent shares between survey-based and tax-based estimates (including capital gains). The result suggests that the official CPS data on Gini (household equalized gross income) fail to capture about half of the increase in overall inequality in the United States as measured by the adjusted Gini index.

These findings seem to indicate that taxation data are able to capture additional information which is not recorded within statistical surveys. Yet, it is also important to stress here that the extent to which estimates based on survey data can be adjusted using tax statistics is not yet fully understood and investigated. Moreover, the required "adjustments" may well be different across countries. Such adjustments are increasingly implemented within the literature.

Atkinson (2007) provides the intuitive formal *approximate* relationship between the top share and the Gini coefficient, $G=(1-S)G^{*}+S$ where G represents the overall Gini coefficient and S is the top share and G^{*} is the Gini coefficient for the rest of the population excluding the top individuals. However, the above-mentioned derivation requires the assumption that the top income group refers to an infinitesimal share of the population (say top 1, top 0.1, or top 0.01 percent). Alvaredo (2011) subsequently obtains the more general derivation valid for non-infinitesimal top groups as well, $G=(1-S)(1-P)G^{*}+S-P+G^{**}PS$, where P is the population share of the top group under investigation and G^{**} the Gini relative to the distribution of income within the top group (G^{**} can be further simplified to $1/(2-\alpha)$, assuming that the right tail is Pareto-distributed with coefficient α).

Under the presumption that the observed Gini coefficient (obtained from standard survey data) is a better representation of inequality within the bottom group (G^{*}), we can use the above results to obtain estimates of the adjusted Gini for the whole population (G). This could be considered to be the first

---

individual business income." However, it is also true, as noted in APS (2011) that "Before TRA 1986, small corporations retained earnings and profits accrued to shareholders as capital gains eventually realized and reported on individual tax returns. Therefore, income including capital gains does not display a discontinuity around TRA 1986 (1986 is artificially high due to high capital gains realizations before capital gains tax rates went up in 1987)."

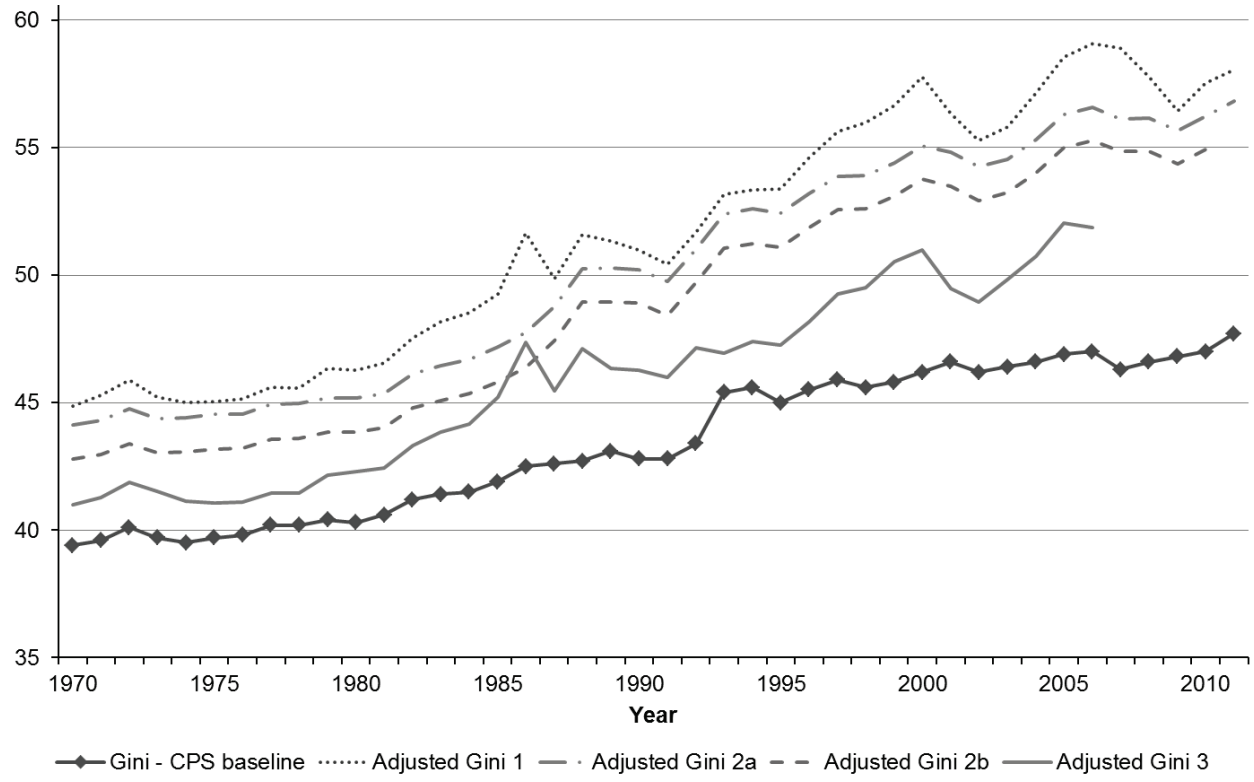
approximate attempt to correct overall measure of inequality using the available additional information about the top income share (for instance this was illustrated for the case of Argentina in Alvaredo, 2011). From the discussion above one can already expect the actual value of the adjusted measure of Gini to depend on the choice of top shares to be used.

Assuming that the top percentile is excluded from the national household survey we can illustrate the adjustment of the official Gini coefficient of gross equalized household income (including cash transfers) from the CPS data in the case of the United States. Using Atkinson's original formula illustrated above and the top 1 percent share from the WTID including capital gains, the adjustment is worth 5 percentage points in 1970 and more than 10 percentage points in 2006 (Figure 28). The adjustment is approximately 1 percentage lower if we use the top 1 percent excluding capital gains. Furthermore, by using Alvaredo's more general formula, the adjustment is further reduced by one additional percentage point.

Such adjustments, however, depend on the strong assumption (not necessarily true) about the exact share of national income thought to be excluded from the household survey statistics. Such an assumption has to be carefully assessed before carrying out any corrections to the shares. Indeed, one could obtain adjusted-Gini measures in a slightly more sophisticated way, by estimating the top shares using both the survey and the taxation administrative data, adopting a homogeneous methodology (e.g. unit of analysis, income definition, control totals, etc.). The formulas mentioned above will then serve to adjust the available Gini from the survey data using the difference "D" of the estimates of top shares using different sources, $G=(1-D)G^{*}+D$. A similar adjustment was carried out for the case of the United States discussed above and illustrated in APS (2011).[77] This adjustment, using top income shares including capital gains, is represented within Figure 28 and represents a substantially smaller adjustment to the Gini coefficient than the ones discussed above (an approximate change of 1.5 percentage points in

[77]However, the measure of the Gini used for the correction within APS (2011) and here is not computed from the survey using a methodology comparable to that of tax statistics. On the contrary, for illustrative purpose, they merely took the baseline Gini from the official publication of the CPS data.

Figure 28. Adjusting the U.S. Gini Coefficient Using the Top Income Shares



Sources: Burkhauser, Feng, Jenkins, and Larrimore (2012), Atkinson, Piketty, and Saez (2011), and calculations of the authors.

Notes: The baseline Gini coefficient represents the headline series of the US Current Population Survey (CPS), based on household equivalized gross income. Top income shares as estimated in Piketty and Saez (2003), Saez (2012) and Burkhauser, Feng, Jenkins, and Larrimore. (2009) are then used to calculate adjust measures of Gini coefficient. We have carried out 4 different adjustments. ***Adjustment 1*** assumes that the top 1 percent (including capital gains) is not captured at all within the household survey statistics and we use the formula by Atkinson (2007) to derive the "true" Gini coefficient: $G=(1-S)G^{*}+S$ where G represents the overall Gini coefficient and S is the top share and G^{*} is the Gini coefficient for the rest of the population excluding the top individuals. ***Adjustment 2a*** uses the same formula above but top 1 percent excluding capital gains. ***Adjustment 2b***, on the contrary, makes use of the more general specification highlighted by Alvaredo (2011): $G=(1-S)(1-P)G^{*}+S-P+G^{**}PS$, where P is the population share of the top group under investigation and G^{**} the Gini relative to the distribution of income within the top group (G^{**} can be further simplified to 1/(2-α), assuming that the right tail is Pareto-distributed with coefficient α). Finally, the ***adjustment 3*** assumes that the top 1 percent share is partially captured within the national survey. The difference "D" of the estimates of top shares using taxation statistics (and including capital gains) from those using survey data and apply the following correction is then used to apply the following adjustment $G=(1-D)G^{*}+D$.

1970 and 5 points in 2006 with respect to the actual baseline Gini coefficient based on gross income). This suggests that more than half of the increase in inequality from 1970 to 2006 is not captured by the inequality measure (based on household surveys) which excludes a sizeable part of the top 1 percent share of national income as estimated with taxation data.[78]

Finally, one could go beyond the first-approximation adjustments we have discussed above by matching the individual information within surveys using administrative data with full coverage of the population. Not much research has been carried out yet at this stage and this remains an important open issue which will attract the attention of economists and statisticians in the coming years.

To conclude, top income shares tend to be underestimated within household surveys (especially above the 99th percentile) and we have shown that taxation data can provide, in some cases, additional and complementary information which could not be otherwise recorded. Given the relentless increase in top income shares in many advanced and developing countries, it is possible that the official indicators of income inequality might substantially and increasingly underestimate the extent of the change in the actual dispersion of income distribution. However, data on reported income for taxation purposes are not without caveats, as we extensively discussed within the text, and caution is prudent in applying any kind of approximate correction to a Gini coefficient that is heavily dependent on arbitrary choices.

4B.viii. Changes in Top Income Shares as Proxies for the Overall Income Distribution?

We have discussed above how top income shares, as measured using tax statistics may not be fully represented within household survey data. However, changes in top shares may still be informative about the dynamics of the income distribution as a whole, especially if much of the action is at the top, as suggested by the burgeoning literature on top incomes.

The analysis of data within this chapter highlighted how different measures of inequality generally result in similar impressions of how inequality has changed and which countries have the most

---

[78]This was also recalled in APS (2011).

unequal distributions of income, whether based on the entire distribution or only on top-income households. For instance, it is true that countries with higher top 1 percent shares also tend to have higher Gini coefficients, S80/S20 ratios, and P90/P10 ratios, although the correlation coefficient is substantially less than one. The top 1 percent share (using pre-tax income of tax units) and the Gini coefficient (using disposable household income) have a correlation coefficient of 0.65; using the S80/S20 ratio the correlation is also 0.65, and using the P90/P10 ratio, it is 0.72.[79]

Consistent with this evidence, an important study by Leigh (2007) found that the correlation between top shares and Gini coefficients[80] is not only strong in the cross-section but also once country fixed effects and common time effects are controlled for. This suggests that within-country *changes* of top income shares and Gini coefficients are also strongly correlated.

Given the importance of the work by Leigh (2007), and similar to what was done in Chapter 8, we extend here his analysis by making use of updated data on both top income shares and Gini coefficients made available since Leigh has published his work.[81] However, we further extend the work in several respects. First of all, we used two additional series of Gini coefficients. Specifically, we use the Gini series (related to household equivalized disposable income) assembled by Atkinson and Morelli (2012 , 2014) within the *Chartbook of Economic Inequality*[82] and we make use of series of Gini

---

[79]The simple pairwise correlations between the different inequality measures were calculated using the figures from Table 2 and Figure 24.

[80]The study by Leigh (2007) made use of Gini coefficients of household disposable income from the Luxembourg Income Study (LIS) and from the World Income Inequality Database (WIID).

[81]For evidence on the relationship between Gini coefficients and top income shares for developing countries we direct the reader to Chapter 10.

[82]The *Chartbook of Economic Inequality* covers more than 100 year period since 1900 for 25 different countries accounting for more than a third of the world population. The database collects information on five different annual measures of 'economic inequality', among which is the Gini index on equivalized household disposable income (remaining measures are top income shares, income or consumption based poverty measures, earnings dispersion measures, and top wealth shares). The underlying figures are available for download at: www.chartbookofeconomicinequality.com.

coefficients of gross/market income[83] which is more directly comparable with the series of top income shares. Although Leigh's analysis stretches back to the early years of twentieth century, we focus here on the post-1970 period only.

Second, and most importantly, we acknowledge here that Leigh's original specification treats top income shares as the dependent variable. To the extent that we need to analyze the informative content of top shares for the overall income distribution measures, this is not necessarily the preferred approach.[84] Thus, we reverse the order of the regression variables by regressing the log of Gini on the log of top shares in order to obtain more direct information about the elasticity of the Gini coefficient to changes in top share. This is shown in Table 7 where the elasticity of Gini to changes in top shares is estimated to be in the range of 10 to 40 percent with strong statistical significance if we consider the whole post-1970 period.

As a third step, we also estimate the elasticity of Gini coefficients to changes in the top 1 percent across three different sub-periods: 1970–1985, 1986–2000, and 2001–2012. This allows us to study the evolution of the elasticity of the Gini to change in the top 1 percent over time.[85] The findings show that the relationship between changes in top shares and changes in the Gini coefficient tends to disappear during the latest period (Table 8).[86] This seems consistent with the facts observed within previous sections, where top shares show no sign of having "peaked," while Gini coefficients have increased at a

---

[83]These series, with few exceptions, are mostly retrieved from the OECD Inequality database accessed on October 1, 2013.

[84]The regression order of two variables is irrelevant only if the variables under investigation are standardized. Furthermore, the choice of the order of regression is essentially a scientific one and reflects the nature of the theory underlying the empirical specification.

[85]Different from Leigh (2007) we also focus exclusively on the top 1 percent and not on the top 10 percent. Moreover we check the relationship between top 1 percent shares and Gini coefficients only, excluding other types of inequality measures, such as Atkinson's indexes and inter-fractile ratios.

[86]It is worth noting that the relationship between the top 1 percent and Gini is generally more robust over time using data from the *Chartbook of Economic Inequality*. For simplicity, Table 8 exclusively represents the evidence about Gini based on gross income from the OECD and Gini based on net income from LIS data.

Table 7. Assessing the Elasticity of Gini Coefficients to Changes in Top 1 Percent Shares

	Pooled OLS Regression		OLS Regression with Country Fixed Effects		OLS Regression Including Country and Time Effects	
Regressing log (Gini) on log (Top 1%): data from 1970 to 2011						
Gini (disposable income) – LIS	0.3		0.2		0.2	
	(0.03)***		(0.03)***		(0.1)***	
Gini (disposable income) – WIID		0.2		0.2		0.2
		(0.04)***		(0.03)***		(0.1)***
R^2	*0.50*	*0.13*	*0.91*	*0.65*	*0.93*	*0.80*
N	*103*	*373*	*103*	*373*	*103*	*373*
Gini (disposable income)- Chartbook	0.4		0.3		0.3	
	(0.02)***		(0.01)***		(0.03)***	
Gini (gross income) – OECD		0.1		0.2		0.01
		(0.02)***		(0.01)***		(0.03)
R^2	*0.45*	*0.05*	*0.93*	*0.80*	*0.93*	*0.91*
N	*343*	*245*	*343*	*245*	*343*	*245*

Note: Significance levels of 10%, 5%, and 1% are respectively indicated by *, **, and ***.

Table 8. Assessing the Elasticity of Gini Coefficients to Changes in Top 1 Percent Shares over Time

	Period 1: 1970–1985	*Period 2: 1986–2000*	*Period 3: 2001–2012*
Gini (disposable income) – LIS	0.2 (0.07) ***	0.2 (0.05)***	-0.1 (0.2)
R^2	*0.95*	*0.60*	*0.93*
N	*22*	*60*	*60*
Gini (gross income)– OECD	0.1 (0.04)***	0.2 (0.04)***	0.03 (0.05)
R^2	*0.85*	*0.98*	*0.90*
N	*61*	*98*	*86*

Note: Significance levels of 10%, 5%, and 1% are respectively indicated by *, **, and ***.
Regressing log(Gini) on log(top1) using fixed effects regression with robust SEs.

slower pace in many countries since the 1980s or the 1990s. The reasons, as discussed before, may be that household income surveys poorly measure the top share.[87]

Finally, we also replicate[88] here the original specification (regressing log of top shares on the log of Gini) by Leigh (2007). Results are represented within Table 9, where the original results by Leigh 2007 (Panel A) are compared respectively to those making use of more up-to-date data (Panel B) as well as to the results based on two different series of Gini coefficients (Panel C).

It is worth noting that the use of up-to-date and adjusted inequality series, together with the restriction to the post-1970 period, does not seem to affect the validity of Leigh's findings (Panel B). Similarly, the use of the two additional series of Gini coefficients (Panel C) substantially confirms the findings of Leigh (2007).[89] The latter result is relevant as Gini coefficients based on pre-tax and pre-transfer income are more appropriate data series to compare to top income shares (based on gross income).[90]

To summarize, the relationship between changes of top shares and Gini coefficients documented in Leigh (2007) remains strong and robust to the controls for updated information, restricted period sample, and different Gini indicators, including that based on pre-tax and pre-transfer income. Hence, changes in top income shares remain, on average, a good proxy for overall income distribution despite the misrepresentation of top income brackets within the statistical survey data documented above. However, there is evidence suggesting that the relationship between Gini and top shares became weaker during the

---

[87]For instance, Kenworthy and Smeeding (2013) show that in the United States, once the top centile is removed from survey data, income inequality has increased much more modestly since the mid-1990s.These findings suggest that, viewed cross-sectionally, the rise in the top end has driven much of the distribution in the United States.

[88]We thank Andrew Leigh for kindly providing the original code which eased the replication of the findings.

[89]The strong association between changes in top 1 percent shares and Gini coefficients is only weakened once we restrict the analysis to the use the Gini coefficients based on gross-income definition and we use the time and fixed effects specification. Indeed, the elasticity coefficient based on the two-way fixed effects regressions between the top 1 percent and gross Gini is no longer statistically different from zero.

[90]Results are broadly consistent using top 10 percent share although results are not tabulated. The findings are available upon request.

Table 9. Assessing the Association between the Top 1 Percent and Gini Coefficients. Replicating the Findings by Leigh (2007)

	Pooled OLS Regression		OLS Regression with Country Fixed Effects		OLS Regression Including Country and Time Effects	
Panel A: Original findings by Leigh (2007) : all observation available from 1886 to 2004—Regressing log (Top 1%) on log (Gini)						
Gini (disposable income) – LIS	1.45 (0.203) ***		1.19 (0.298)***		0.797 (0.62)	
Gini (disposable income) – WIID		0.799 (0.086)***		0.693 (0.1)***		0.422 (0.07)***
R^2	*0.44*	*0.29*	*0.83*	*0.67*	*0.96*	*0.89*
N	*63*	*300*	*63*	*300*	*63*	*300*
Panel B: Original specification by Leigh (2007) re-run with up-to-date observations: data from 1970 to 2011—Regressing log (Top 1%) on log (Gini)						
Gini (disposable income) – LIS	1.5 (0.1)***		2.1 (0.3)***		0.7 (0.3)***	
Gini (disposable income) – WIID		0.6 (0.1)***		0.4 (0.1)***		0.2 (0.1)***
R^2	*0.50*	*0.13*	*0.77*	*0.66*	*0.93*	*0.85*
N	*103*	*373*	*103*	*373*	*103*	*373*
Panel C: Original specification by Leigh (2007) re-run using different Gini series: data from 1970 to 2011—Regressing log (Top 1%) on log (Gini)						
Gini (disposable income)–Chartbook	1.0 (0.1)***		1.9 (0.1)***		1.0 (0.04)***	
Gini (gross income) –OECD		0.7 (0.2)***		2.3 (0.2)***		0.1 (0.3)
R^2	*0.45*	*0.02*	*0.82*	*0.81*	*0.90*	*0.93*
N	*343*	*245*	*343*	*245*	*343*	*245*

Note: Significance levels of 10%, 5%, and 1% are respectively indicated by *, **, and ***.

first decade of the twenty-first century, suggesting that household surveys may not entirely capture the dynamics of income at the top. This suggests greater prudence is called for in extrapolating the validity of any results based on the analysis of top income shares directly to the overall income distribution.[91]

5. SUMMARY AND CONCLUSIONS

Our chapter has focused on a wealth of new inequality data that has grown in detail, form, and importance since 2000. In addition to LIS, which was the bedrock of the Gottschalk and Smeeding (2000) chapter, OECD, EU-SILC, and a series of country trend data, maintained in part by Atkinson and Morelli (2012, 2014) and Brandolini and Smeeding (2008, 2009), have made a tremendous difference in what we know about levels and trends in inequality and poverty over the past 30 years. Importantly, a whole new set of WTID data has proliferated and offers long-term trends in inequality for tax units at the top of the distribution. All of these new data come with new complications and caveats discussed in the previous sections. Despite these caveats, these data do allow us to make a few overall summarizing observations about levels and trends in poverty and inequality over the last thirty years.

The modest conclusions we draw here include:

1. Of 28 rich and MIC nations in the late 2000s, 17 nations successfully reached "single digit" poverty rates (where between 5 and 10 percent of the country's population are poor by the half median relative poverty measure). But the range of poverty rates in rich nations alone varies by a factor of almost four, and by adding MICs, a factor of five. Hence, one experiences a wide range of relative poverty rates in these nations. Our trend data suggests that progress against poverty was uneven and rare in rich nations over the past 20 to 30 years. Other than Mexico, relative poverty rates were not consistently falling over the past 15–20 years in any of the nations we examine here.

2. We conclude that while there was little progress in reducing relative poverty in almost all the rich countries examined here over the past two or three decades and up to 2010, real living standards for the poor have changed over this same period. Anchored poverty is an increasingly useful concept to establish how upward and downward changes in real median incomes affect poverty differently from a solely relative measure. And anchored poverty fell in almost all rich nations from the 1990s to 2007, owing to rising living standards in most of the rich world up to that point. However, since the Great Recession (GR), increases in anchored poverty up to 2010 reduced

[91]This conclusion appears to differ from what was discussed in Chapter 8, where the focus on the long-run relationship between top shares and Gini coefficients does not allow identifying the weakening of such relationship for the first decade of the twenty-first century.

some of the progress in real living standards that low-income households experienced over the preceding 15 years.

3. Inequality rose (almost) everywhere over the 1970 to 2010 period, with some flattening in the Great Recession (GR) although the longer-term rising trend continued. Small changes year-to-year may produce strong trends over a 20–30 year period. Long-term increases are evident in the Gini coefficients, P90/P10 ratios, and S80/S20 ratios for disposable household income calculated using household surveys, and also with top-income shares calculated with tax data.

4. The cyclicality of some measures of inequality—particularly for top-income shares—is demonstrated clearly in the trends calculated with the WTID. Recessions have depressed the incomes of the rich especially, but these incomes bounced back even stronger after the recessions of the last decades of the twentieth century. Preliminary evidence suggests the same pattern will likely hold for the GR.

5. The 1950–1980 period stands out as the "golden age" for labor and falling or stable inequality in the rich western nations. Several additional nations now show a U-shaped pattern of inequality, with inequality rising even more since the last look at this phenomenon 14 years ago (Gottschalk and Smeeding, 1997, 2000; OECD 2011). The longer time series of the WTID shows an even stronger U shape in inequality trends in these data

6. Cross-national inequality rankings in the most recent data largely look similar to how they appeared fifteen or even thirty years ago. The English-speaking countries (led by the United States and the United Kingdom) are the most unequal, by most measures, and the Nordic countries are the least unequal. There have been some important changes to note as well. New data allow us to add Israel and South Africa to the list of the most unequal. Also, the distance between the most and least unequal among rich countries has diminished, as inequality growth surged in some of the least unequal.

7. Increasingly one has to examine capital income as well as earned income. Rising income from capital is more concentrated at the top of the distribution, as seen in the WTID in many nations since the 1990s and through the GR.

8. Broad-based distribution measures increased most in the 1970s, 1980s, or 1990s (depending on the country) but rose less, and were sometimes stable, in the 2000s. Using top-income shares, however, inequality appears to still be rising, and shows no sign of having "peaked." How long this pattern can continue is an open question.

9. The relentless rise in top income shares poses new challenges to the informative content of different indicators of income inequality. On the one hand, intrinsic limitations of existing household surveys do not capture the entirety of income accruing to the top income brackets. This suggests that conventional measures such as the Gini coefficient may be increasingly missing the actual extent of the change in income inequality. On the other hand, there is evidence suggesting that the relationship between Gini and top shares became weaker over the past decade, pointing to greater prudence in extrapolating any results based on the analysis of top income shares directly to the overall income distribution.

The future research agenda for empirical studies of inequality and poverty is quite rich and may provide the answers to many questions that are not clear at this point. Additional research on the relationship of inequality and economic growth, as well as who receives the growth dividends, is called

for. In a rich and aging world, how will changes in the age distribution affect inequality? And perhaps most importantly, the increasing availability and usefulness of data from MICs will provide us with comparisons to the living standards in these and poorer countries as well. Suffice to say that with inequality rising in most rich nations and with increased coverage of the top 1 percent of income earners, and of MICs, we still have much to learn about inequality, its sources, its origins, and its effects on social and economic outcomes. It is indeed time to bring inequality back into the fold of mainstream economics as Atkinson (1997) has suggested.

REFERENCES

Aaberge, R., Atkinson, A.B. (2008). "Top incomes in Norway." Statistics Norway Discussion Paper Series n.552.

Aaron, H. (1985). "Comments on methods of measuring noncash benefits." Reported in Noncash Benefits: An Evaluation of the Census Bureau's Measurement Conference, PEMD-86-8BR. U.S. General Accounting Office, Washington, DC, April.

Allison, P. (1978). "Measures of inequality." American Sociological Review 43(6), 865–880.

Alvaredo, F., Saez, E. (2009). "Income and wealth concentration in Spain from a historical and fiscal perspective." Journal of the European Economic Association 7(5), 1140–1167.

Alvaredo, F., Atkinson, A.B., Piketty, T., Saez, E. (2012). The World Top Incomes Database, Accessed in September 2013. http://topincomes.g-mond.parisschoolofeconomics.eu/

Alvaredo, F., Atkinson, A.B., Piketty, T., Saez, E. (2013). "The top 1 percent in international and historical perspective." Journal of Economic Perspectives 27(3), 3–20.

Alvaredo, F. (2009). "Top incomes and earnings in Portugal 1936–2005." Explorations in Economic History 46(4), 404–417.

Alvaredo, F. (2010). "The rich in Argentina over the Twentieth Century, 1932–2004." In: Atkinson, A.B., Piketty, T. (Eds.), Top Incomes: A Global Perspective. Oxford and New York: Oxford University Press.

Alvaredo, F. (2011). "A note on the relationship between top income shares and the Gini Coefficient." Economics Letters 110(3), 274–277.

Atkinson, A.B. (1970). "On the measurement of inequality." Journal of Economic Theory 2, 244–263.

Atkinson, A.B. (1983). The Economics of Inequality, 2nd edition. Oxford: Clarendon Press.

Atkinson, A.B. (2004). “Increased income inequality in OECD countries and the redistributive impact of the government budget.” In: Cornia, G.A. (ed.), Inequality, Growth, and Poverty in an Era of Liberalization and Globalization, pp. 220–248, Oxford: Oxford University Press.

Atkinson, A.B. (2005). “Top incomes in the UK over the 20th century.” Journal of the Royal Statistical Society: Series A (Statistics in Society) 168(2), 325–343.

Atkinson, A.B. (2007). “Measuring top incomes: methodological issues.” In Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries, eds. A.B. Atkinson and T. Piketty, Pp. 18–42, Oxford: Oxford University Press.

Atkinson, A.B. (2010). “Top incomes in a rapidly growing economy: Singapore.” In Top Incomes: A Global Perspective, eds. A.B. Atkinson and T. Piketty, Pp. 220–252, Oxford and New York: Oxford University Press.

Atkinson, A.B., Brandolini, A. (2001). “Promises and pitfalls in the use of secondary data-sets: income inequality in OECD countries as a case study.” Journal of Economic Literature 39: 771–800.

Atkinson, A.B., Cantillon, B., Marlier, E., Nolan, B. (2002). Social Indicators: The EU and Social Inclusion. Oxford: Oxford University Press.

Atkinson, A.B., Harrison, A.J. (1978). The Distribution of Personal Wealth in Britain. Cambridge, MA: Cambridge University Press.

Atkinson, A.B., Leigh, A. (2005). “The distribution of top incomes in New Zealand.” Australian National University CEPR Discussion Paper 503.

Atkinson, A.B., Leigh, A. (2007). “The distribution of top incomes in Australia.” Economic Record 83(262), 247–261.

Atkinson, A.B., Micklewright, J. (1992). Economic Transformation in Eastern Europe and the Distribution of Income. Cambridge, MA: Cambridge University Press.

Atkinson, A.B., Morelli, S. (2012). “Chartbook of economic inequality: 25 countries 1911–2010.” INET Research Note #15, Institute for New Economic Thinking, New York, October.

Atkinson, A.B., Morelli, S. (2014). Chartbook of Economic Inequality. www.chartbookofeconomicinequality.com

Atkinson, A.B., Piketty, T. (2007). Top Incomes Over the 20th Century: A Contrast between Continental European and English-Speaking Countries. Oxford: Oxford University Press.

Atkinson, A.B., Piketty, T. (2010). Top Incomes: A Global Perspective. Oxford and New York: Oxford University Press.

Atkinson, A.B., Salverda, W. (2005). “Top incomes in the Netherlands and the United Kingdom over the 20th Century.” Journal of the European Economic Association 3(4), 883–913.

Atkinson, A.B, Piketty, T., Saez, E. (2010). “Top incomes in the long run of history.” in Top Incomes: A Global Perspective. In Atkinson, A.B. and T. Piketty, 664–759. Oxford and New York: Oxford University Press.

Atkinson, A.B, Piketty, T., Saez, E. (2011). "Top incomes in the long run of history." Journal of Economic Literature 49(1), 3–71.

Atkinson, A.B., Marlier, E. (2010). Income and Living Conditions in Europe, Eurostat at http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-31-10-555/EN/KS-31-10-555-EN.PDF

Atkinson, A.B., Marlier, E., Montaigne, F., Reinstadler, A. (2010). "Income poverty and income inequality." in A.B. Atkinson, E. Marlier (Eds.) Income and Living Conditions in Europe, Luxembourg: Publications Office of the European Union.

Atkinson, A.B., Rainwater, L., Smeeding, T.M. (1995). Income Distribution in OECD Countries: The Evidence from the Luxembourg Income Study (LIS), Paris: Organization for Economic Cooperation and Development.

Auten, G., Gee, G., Turner, N. (2013). "Income inequality, mobility and turnover at the top in the U.S., 1987–2010." American Economic Review 103(3), 168–172.

Banerjee, A., Piketty, T. (2005). "Top Indian incomes, 1922–2000." World Bank Economic Review 19(1), 1–20.

Björklund, A. (1993). "A comparison between actual distributions of annual and lifetime income: Sweden 1951–89." Review of Income and Wealth 39, 377–386.

Björklund, A., Freeman, R. (1997). "generating equality and eliminating poverty—the Swedish way." In R.B. Freeman, R. Topel, and B. Swedenborg (eds.), The Welfare State in Transition: Reforming the Swedish Model. Chicago: University of Chicago Press.

Björklund, A., Palme, M. (2002). "Income redistribution within the life cycle versus between individuals: empirical evidence using Swedish panel data." In D. Cohen, T. Piketty, G. Saint-Paul (eds), The Economics of Rising Inequalities, pp. 205–223, Oxford: Oxford University Press.

Blank, R. (2008). "How to improve poverty measurement in the United States." Journal of Public Analysis and Management 27(2), 233–254.

Boadway, R., Keen, M. (2000). "Redistribution." In A.B. Atkinson and F. Bourguignon (eds.), Handbook of Income Distribution, Vol. 1, pp. 677–789, Amsterdam: North-Holland.

Böheim, R., Jenkins, S.P. (2006). "A comparison of current and annual measures of income in the British Household Panel Survey." Journal of Official Statistics 22, 733–758.

Boltvinik, J. (2000). Poverty Measurement and Trends. United Nations Development Programme, SEPED Series on Poverty Reduction. NY: United Nations. (www.undp.org/poverty/publications/pov_red).

Booth, C. (1903). Life and Labour of the People of London. Second Series, Industry, Volume 5, London: Macmillan and Co.

Bradbury, B., Jäntti, M. (1999). Child Poverty across Industrialized Nations, UNICEF International Child Development Centre, Innocenti Occasional Papers, Economic and Social Policy Series no. 71, September.

Brandolini, A. (2007). "Measurement of income distribution in supranational entities: the case of the European Union." in S.P. Jenkins, J. Micklewright (eds.), Inequality and Poverty Re-examined, pp. 62–83, Oxford: Oxford University Press.

Brandolini, A., Magri, S., Smeeding, T.M. (2010). "Asset-based measurement of poverty." Journal of Policy Analysis and Management 29(2), 267–284.

Brandolini, A., Vecchi, G. (2011). "The well-being of Italians: a comparative historical approach." Bank of Italy Quaderni di Storia Economica No. 19, October.

Brandolini, A., Smeeding, T.M. (2008). "Inequality patterns in western-type democracies: cross-country differences and time changes." In P. Beramendi, C. J. Anderson (eds.), Democracy, Inequality and Representation, New York: Russell Sage Foundation.

Brandolini, A., Smeeding, T.M. (2009). "Income inequality in richer and OECD countries." in Oxford Handbook of Economic Inequality, W. Salverda, B. Nolan, T.M. Smeeding (eds.), 71–100, Oxford: Oxford University Press.

Brewer, M., Muriel, A., Phillips, D., Sibieta, D. (2008). Poverty and Inequality in the UK: 2008. London: Institute for Fiscal Studies.

Buhmann, B., Rainwater, L., Schmaus, G., Smeeding, T.M. (1988). "Equivalence scales, well-being, inequality, and poverty: sensitivity estimates across ten countries using the Luxembourg Income Study (LIS) Database." Review of Income and Wealth 34, 115–142.

Burkhauser, R.V., Feng, S., Jenkins, S.P. (2009). "Using the P90/P10 Index to measure US inequality trends with Current Population Survey data: A view from inside the Census Bureau vaults." Review of Income and Wealth, 55 (1), March, 166–185.

Burkhauser, R.V., Feng, S., Jenkins, S.P., Larrimore, J. (2012). "Recent trends in top income shares in the USA: Reconciling estimates from March CPS and IRS tax return data." Review of Economics and Statistics, 94(2), May, 371–388.

Burkhauser, R.V., Larrimore, J., Simon, K. (2012). "A second opinion on the economic health of the American middle class and why it matters in gauging the impact of government policy." National Tax Journal 65, 7–32.

Burkhauser, R.V., Hahn, M.H., Wilkins, R. (2013). "Measuring top incomes using tax record data: A cautionary tale from Australia." Melbourne Institute Working Paper Series, Working Paper No. 24/13.

Caminada, K., Goudswaard, K., Wang, C. (2012). "Disentangling income inequality and the redistributive effect of taxes and transfers in 20 LIS countries over time." Luxembourg Income Study Working Paper No. 581, September.

Canberra Group (2001). Final Report and Recommendations of the Canberra Expert Group on Household Income Statistics, Ottawa, Canada.

Canberra Group (2011). Canberra Group Handbook on Household Income Statistics, Second Edition, Geneva, at http://www.unece.org/fileadmin/DAM/stats/groups/cgh/Canbera_Handbook_2011_WEB.pdf.

Chen, S., Ravallion, M. (2012). "Absolute poverty measures for the developing world." In Measuring the Real Size of the World Economy, Chapter 20, Washington, DC: World Bank.

Clark, A., d'Ambrosio, C. (2014). "Attitudes to income inequality: experimental and survey evidence." In Handbook of Income Distribution, A.B. Atkinson, F. Bourguignon (eds.), Volume 2A, Chapter 14, November, Elsevier.

Clemenceau, A., Museux, J.M. (2007). EU-SILC (community statistics on income and living conditions: general presentation of the instrument), in Comparative EU statistics on Income and Living Conditions: Issues and Challenges – Proceedings of the EU-SILC conference (Helsinki, 6–8 November 2006), 13–36, Luxembourg: Office for Official Publications of the European Communities.

Cobham, A., Sumner, A. (2013). "Is it all about the tails? The Palma Measure of income inequality." Center for Global Development, Working Paper 343, September 2013.

Coleman, J. (1988). "Social capital in the creation of human capital." American Journal of Sociology 94, S95–S120.

Coleman, J., Rainwater, L. (1978). Social Standing in America. New York: Basic Books.

Coulter, F.A.E., Cowell, F.A., Jenkins, S.P. (1992). "Equivalence scale relativities and the extent of inequality and poverty." Economic Journal 102, 1067–1082.

Cowell, F.A., Victoria-Feser, M.P. (1996). "Robustness properties of inequality measures." Econometrica 64, 77–101.

Cowell, F.A. (2000). "Measurement of inequality", in A. B. Atkinson and F. Bourguignon (Eds.) Handbook of Income Distribution: Volume 1, 87–166, Amsterdam: North Holland.

Danziger, S., Taussig, M.K. (1979). "The income unit and the anatomy of income distribution." Review of Income and Wealth 25, 365–375.

Deaton, A. (2005). "Measuring poverty in a growing world (or measuring growth in a poor world)." Review of Economics and Statistics 87, 1–19.

Deaton, A., Grosh, M. (2000). "Consumption." In M. Grosh, P. Glewwe (eds.), Designing household survey questionnaires for developing countries. Lessons from 15 years of the Living Standards Measurement Study, vol. 1, 91–133, Washington, DC: World Bank.

Deding, M.C., Dall Schmidt, T. (2002). "Differences in income inequality across Europe – market driven or …?" European Panel Analysis Group Working Paper 2002-37, December.

Deininger, K., Squire, L. (1996). "A new data set measuring income inequality." Washington, DC: World Bank Economic Review 10, 565–591. Data available at http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20699070~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html.

DeNavas-Walt, C., Proctor, B.D., Smith, J.C. (2012). Income, Poverty, and Health Insurance: 2011. Current Population Reports, P60-243, U.S. Census Bureau, at http://www.census.gov/prod/2012pubs/p60-243.pdf.

Department for Work and Pensions (UK) (2012). Households Below Average Income, available at http://research.dwp.gov.uk/asd/index.php?page=hbai.

Dhongde, S. (2013). "Measuring multidimensional poverty in the U.S." Presentation at Institute for Research on Poverty, University of Wisconsin–Madison, March 20.

Dowrick, S., Akmal, M. (2005). "Contradictory trends in global income inequality: a tale of two biases." Review of Income and Wealth 51, 201–229.

Ebert, U. (1997). "Social welfare when needs differ: an axiomatic approach." Economica 64, 233–244.

Eurostat (1998). Recommendations of the Task Force on Statistics on Social Exclusion and Poverty, Luxembourg: European Statistical Office, October.

Eurostat (2000). Report of the Working Group: Statistics on Income, Social Exclusion and Poverty, Luxembourg: European Statistical Office, April.

Eurostat (2005). Income Poverty and Social Exclusion in the EU25, Statistics in Focus 03/2005, Luxembourg: Official Publications of the European Communities.

Eurostat (2011). Social Protection and Social Exclusion—The social dimension of the Europe 2020 strategy. Available at http://ec.europa.eu/social/main.jsp?catId=750&langId=en&pubId=5976&type=2&furtherPubs=yes

Faik, J. (2012). "Income inequality and poverty in front of and during the Economic Crisis – an empirical investigation for Germany, 2002–2010." SOEP Paper #450, DIW Berlin.

Fisher, J., Johnson, D., Smeeding, T.M. (2012). "Inequality of income and consumption: measuring the trends in inequality from 1985–2010 for the same individuals." Paper prepared for the 32nd General Conference of the International Association for Research in Income and Wealth, August.

Förster, M. (1993). "Comparing poverty in 13 OECD countries: traditional and synthetic approaches." Studies in Social Policy 10, Paris: OECD, October.

Foster, J., Greer, J., Thorbecke, E. (1984). "A class of decomposable poverty measures." Econometrica 3(52), 761–766.

Frick, J.R., Grabka, M.M. (2003). "Imputed rent and income inequality: a decomposition analysis for Great Britain, West Germany, and the U.S." Review of Income and Wealth 49, 513–537.

Friedman, M. (1957). A Theory of the Consumption Function, Princeton, NJ: Princeton University Press.

Fuchs, V.R. (1967). "Redefining poverty and redistributing income." The Public Interest 8, 88–95.

Fuchs-Schündeln, N., Schündeln, M. (2009). "Who stays, who goes, who returns? East-West migration within Germany since reunification." Economics of Transition 17(4), 703–738.

Garfinkel, I., Rainwater, L., Smeeding, T.M. (2006). "A reexamination of welfare state and inequality in rich nations: how in-kind transfers and indirect taxes change the story." Journal of Policy Analysis and Management 25, 855–919.

Garfinkel, I., Rainwater, L., Smeeding, T.M. (2010). Wealth and Welfare States: Is America a Laggard or Leader? Oxford: Oxford University Press.

Gilbert, G. (2008), Rich and Poor in America: A Reference Handbook. New York: ABC-CLIO Press.

Goebel, J., Gornig, M., Haubermann, H. (2010). "Income polarization in Germany is rising." Weekly Report 6(26), DIW Berlin.

Gordon, R.H., Slemrod, J.B. (2000). "Are 'real' responses to taxes simply income shifting between corporate and personal tax bases?" in Does Atlas Shrug? The Economic Consequences of Taxing the Rich, Joel B. Slemrod (ed), Pp. 240–280, New York: Russell Sage Foundation; Cambridge and London: Harvard University Press.

Gornick, J.C., Sierminska, E., Smeeding, T.M. (2009). "The income and wealth packages of older women in cross-national perspective." The Journals of Gerontology: Psychological Sciences 64B(3), 402–414.

Gornick, J.C., Jäntti, M. (2013). Inequality and the Status of the Middle Class, Cambridge, MA: Cambridge University Press.

Gottschalk, P., T.M. Smeeding (1997). "Cross-national comparisons of earnings and income inequality." Journal of Economic Literature 35, 633–687.

Gottschalk, P., Smeeding, T.M. (2000). "Empirical evidence on income inequality in industrialized countries." in A.B. Atkinson, F. Bourguignon (eds), Handbook of Income Distribution, Vol. 1, 261–308, Amsterdam: North-Holland.

Grabka, M., Kuhn, U. (2012). "The evolution of income inequality in Germany and Switzerland since the turn of the millennium." SOEP Paper #464, DIW Berlin.

Groedhart, T., Halberstadt, V., Kapteyn, A., Van Praag, B. (1977). "The poverty line: concept and measurement." Journal of Human Resources 12, 503–520.

Hagenaars, A.J.M., van Praag, B.M.S. (1985). "A synthesis of poverty line definitions." Review of Income and Wealth 31(2), 139–154.

Hagenaars, A.J.M., de Vos, K., Zaidi, M.A. (1994). Poverty Statistics in the Late 1980s: Research Based on Micro-Data, Luxembourg: Eurostat.

Haig, R.M. (1921). "The concept of income: economic and legal aspects." In R.M. Haig (ed.), The Federal Income Tax, 1–28, New York: Columbia University Press.

Haveman, R. (2009). "What does it mean to be poor in a rich society?" In M. Cancian, S. Danziger (eds), Changing Poverty, Changing Policies, New York: Russell Sage Foundation.

Heshmati, A. (2004). "Inequalities and their measurement." IZA Discussion Paper No. 1219, July.

Iacovou, M., Kaminska, O., Levy, H. (2012). "Using EU-SILC data for cross-national analysis: strengths, problems, and recommendations." ISER Working Paper No. 2012-03.

Immervoll, H., Levy, H., Lietz, C., Mantovani, D., O'Donoghue, C., Sutherland, H., Verbist, G. (2006). "Household incomes and redistribution in the European union: quantifying the equalising

properties of taxes and benefits." In D. B. Papadimitriou (ed.), The Distributional Effects of Government Spending and Taxation, 135–165, Basingstoke: Palgrave Macmillan.

Immervoll, H., Richardson, L. (2011). "Redistribution policy and inequality reduction in OECD countries: what has changed in two decades?" Luxembourg Income Study Working Paper No. 571, October.

Internal Revenue Service, U.S. Department of the Treasury (1996). Federal Tax Compliance Research: Individual Income Tax Gap Estimates for 1985, 1988, and 1992, Pub. 1415 (rev. 4-96), April, Washington, D.C.

Internal Revenue Service, U.S. Department of the Treasury (2006). Updated Estimates of the TY 2001 Individual Income Tax Underreporting Gap, Overview, February 22, Washington, DC: Office of Research, Analysis, and Statistics.

International Monetary Fund (2007). World Economic Outlook, October 2007 edition, Washington, DC: International Monetary Fund. Data available at http://www.imf.org/external/pubs/ft/weo/2007/02/weodata/index.aspx.

International Monetary Fund (2013). World Economic Outlook, April 2013 edition, Washington, DC: International Monetary Fund. Data available at http://www.imf.org/external/pubs/ft/weo/2013/01/

Ishikawa, T. (1996). Data runs conducted by Ministry of Welfare, 26 November.

Iwamoto, Y., Fujishima, Y., Akiyama, N. (1995). "Rishi haito kazei no hyoka to kadai (Evaluating interest and dividends taxation)." Finansharu Rebyu 35, 27–50.

Jäntti, M., Danziger, S. (2000). "Income poverty in advanced countries." In A.B. Atkinson, F. Bourguignon (Eds), Handbook of Income Distribution. Vol. 1, 309–378, Amsterdam: North-Holland.

Jäntti, M., Riihelä, M., Sullström, R., Tuomala, M. (2010). "Trends in top income shares in Finland, in top incomes: a global perspective." A.B. Atkinson and T. Piketty (eds), Oxford and New York: Oxford University Press.

Jenkins, S., Brandolini, A., Micklewright, J., Nolan, B. (2013). The Great Recession and the Distribution of Household Income, Oxford: Oxford University Press.

Johnson, D.S., Smeeding, T.M., Torrey, B.B. (2005). "economic inequality through the prisms of income and consumption." Monthly Labor Review 128(4), 11–24.

Johnson, D.S., Smeeding, T.M. (2012). "A consumer's guide to interpreting various U.S. poverty measures." Fast Focus 14-2012. Madison, WI: Institute for Research on Poverty. Available at http://www.irp.wisc.edu/publications/fastfocus.htm.

Johnson, D.S., Smeeding, T.M. (2013). "Inequality Measurement." International Encyclopedia of the Social and Behavioral Sciences, 2nd ed., Elsevier.

Kenworthy, L. (1998). "Do social-welfare policies reduce poverty? A cross-national assessment." Luxembourg Income Study Working Paper #188, Center for Policy Research, Syracuse University, Syracuse, NY, September. http://lissy.ceps.lu/wpapersd.htm

Kenworthy, L., Smeeding, T.M. (2013). "The United States: high and rapidly rising inequality." U.S. country chapter prepared for 2013 GINI Project, January.

Lampman, R. (1964). "The problem of poverty in America." Chapter 2, in Economic Report of the President, 1964, Washington, DC: U.S. Government Printing Office.

Leigh, A., van der Eng, P. (2009). "Inequality in Indonesia: what can we learn from top incomes?" Journal of Public Economics 93(1– 2), 209–212.

Leigh, A. (2007). "How closely do top income shares track other measures of inequality?" Economic Journal 117(524), 619–633.

Leigh, A. (2009). "Top incomes." In The Oxford Handbook of Economic Inequality, W. Salverda, B. Nolan, T. M. Smeeding (eds), Oxford and New York: Oxford University Press.

Lindert, P. (2004). Growing Public: Social Spending and Economic Growth since the Eighteenth Century, Cambridge: Cambridge University Press.

Lindert, P. H., Williamson, J. G. (1982). "Revising England's Social Tables 1688–1812." Explorations in Economic History, Elsevier, vol. 19(4), pages 385–408, October.

Mahler, V.A., Jesuit, D.K. (2006). "Fiscal redistribution in the developed countries: new insights from the Luxembourg Income Study." Socio-Economic Review 4, 483–511.

Marlier, E., Atkinson, A.B., Cantillon, B., Nolan, B. (2007). "The EU and social inclusion: facing the challenges." Journal of Common Market Studies 45(2), 518–533.

Marx, I., Nelson, K. (2013). Minimum Income Protection in Flux. Basingstoke: Palgrave Macmillan.

Meyer, B.D., Sullivan, J.X. (2012a). "Identifying the disadvantaged: official poverty, consumption poverty, and the new Supplemental Poverty Measure." Journal of Economic Perspectives 26(3), 111–136.

Meyer, B.D., Sullivan, J.X. (2012b). "Winning the war: poverty from the Great Society to the Great Recession." Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution, vol. 45(2), 133–200.

Morelli, S. (2013a). "Banking shocks and top income shares." Draft (July), University of Oxford.

Morelli, S. (2013b). "Banking crises and stock market crashes in the U.S.: the response of top income shares in historical perspective." Draft (September), University of Oxford.

Moriguchi, C., Saez, E. (2008). "The evolution of income concentration in Japan, 1886–2005: evidence from income tax statistics." Review of Economics and Statistics 90(4), 713–734.

Newman, K.S., O'Brien, R. (2011). Taxing the Poor: Doing Damage to the Truly Disadvantaged, University of California Press.

OECD (2008). Growing Unequal? Income Distribution and Poverty in OECD Countries, Paris: OECD Publishing.

OECD (2011). Divided We Stand: Why Inequality Keeps Rising, Paris: OECD Publishing.

OECD (2012). Quality review of the OECD database on household incomes and poverty and the OECD earnings database, Part I, 20 December 2012 at http://www.oecd.org/els/soc/income-distribution-database.htm,
and http://www.oecd.org/els/soc/OECDIncomeDistributionQualityReview_PartI.pdf, Table 3

OECD (2013). Crisis Squeezes Income Puts Pressure on Inequality and Poverty, Paris: OECD Publishing.

Orshansky, M. (1965). "Counting the poor: another look at the poverty profile." Social Security Bulletin 28(1), 3–29.

Palma, J.G. (2011). "Homogeneous middles vs. heterogeneous tails, and the end of the 'inverted-u': it's all about the share of the rich." Development and Change 42(1), 87–153.

Pareto, V. (1897). "Cours d'économie politique, Lausanne and Paris, Rouge and Pichon." Reprinted in Oeuvres Complètes, G.-H. Bousquet and G. Busino (eds), Genève: Librairie Droz, 1964.

Piachaud, D. (1987). "Problems in the definition and measurement of poverty." Journal of Social Policy 16(2), 147–164.

Piketty, T., Saez, E., Stantcheva, S. (2012). "Optimal taxation of top labor incomes: a tale of three elasticities." NBER Working Paper No. 17616, November 2011, revised October 2012.

Piketty, T., Saez, E. (2012), "Top incomes and the Great Recession: recent evolutions and policy implications." Draft for the Thirteenth Jacques Polak Annual Research Conference, Washington DC.

Piketty, T., Saez, E. (2003). "Income inequality in the United States, 1913–1998." Quarterly Journal of Economics 118(1), 1–39.

Piketty, T., Saez, E. (2006). "The evolution of top incomes: A historical and international perspective." American Economic Review 96(2), 200–205.

Piketty, T. (2001). Les Hauts Revenus en France au Xxe Siècle: Inegalites et Redistributions 1901–1998. Paris: Grasset.

Piketty, T. (2003). "Income inequality in France, 1901–1998." Journal of Political Economy 111(5), 1004–42.

Piketty, T. (2001). "Les hauts revenus en France au Xxe siècle: Inegalites et redistributions 1901–1998. Paris: Grasset.

Pyatt, G., C.N. Chen, J. Fei (1980). "The distribution of income by factor components." Quarterly Journal of Economics 95: 451–473.

Ravallion, M. (2014). "The idea of antipoverty policy." In Handbook of Income Distribution, A.B. Atkinson, F. Bourguignon (eds.), Volume 2A, Chapter 14, November, Elsevier.

Ravallion, M. (2012). "Poor, or just feeling poor? on using subjective data in measuring poverty." Policy Research Working Paper Series 5968, Washington, DC: The World Bank.

Ravallion, M., Chen, S. (2011). "Weakly relative poverty." Review of Economics and Statistics 93(4): 1251–1261.

Ravallion, M., Chen, S. (2011). "Developing world is poorer than we thought, but no less successful in the fight against poverty." Quarterly Journal of Economics 125(4): 1577–1625.

Rainwater, L. (1990). "Poverty and equivalence as social constructions." Luxembourg Income Study Working Paper #91, Center for Policy Research, Syracuse University, Syracuse, NY.

Redmond, G. (1998). "Households, Families, and the Distribution of Income." Social Policy Research Centre Newsletter 71(1): 4–5.

Reynolds, A. (2007). "Has U.S. income inequality really increased?" Policy Analysis 586: 1–24.

Ringen, S. (1985). "Toward a third stage in the measurement of poverty." Acta Sociologica 28: 99–113.

Roine, J., Waldenström, D. (2011). "Common trends and shocks to top incomes: A structural breaks approach." The Review of Economics and Statistics 93(3): 832–846.

Roine, J., Waldenströmm, D. (2012). "On the role of capital gains in Swedish income inequality." Review of Income and Wealth 58(3): 569–587.

Roine, J., Waldenström, D. (2008). "The evolution of top incomes in an egalitarian society: Sweden, 1903–2004." Journal of Public Economics 92(1–2): 366–387.

Rowntree, B.S. (1903). Poverty: A Study of Town Life. Macmillan, London.

Ruggles, P. (1990). Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy, Washington, DC: Urban Institute Press.

Ryscavage, P. (1995). "A surge in growing income inequality?" Monthly Labor Review 118(8): 51–61.

Saez, E., Veall, M. (2005). "The evolution of high incomes in Northern America: lessons from Canadian evidence." American Economic Review 95(3): 831–849.

Saez, E. (2012). Striking it Richer: The Evolution of Top Incomes in the United States. At http://elsa.berkeley.edu/~saez/

Saez, E., Slemrod, J.B., Giertz, S.H. (2012). "The elasticity of taxable income with respect to marginal tax rates: a critical review." Journal of Economic Literature 50: 3–50.

Salverda, W., Atkinson, A.B. (2007). "Top incomes in the Netherlands over the Twentieth Century." In Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries, A. B. Atkinson and T. Piketty (eds), Pp. 426–471, Oxford and New York: Oxford University Press.

Schwabish, J., Smeeding, T.M., Osberg, L. (2006). "Income distribution and social expenditures." In D.B. Papadimitriou (ed.), The Distributional Effects of Government Spending and Taxation, pp. 247–288, Basingstoke: Palgrave Macmillan.

Sen, A.K. (1976). "Poverty: an ordinal approach to measurement." Econometrica 46: 437–446.

Sen, A.K. (1983). "Poor, relatively speaking." Oxford Economic Papers 35: 153–169.

Sen, A.K. (1992). Inequality Reexamined. Oxford: Clarendon Press.

Sharpe, A., Capeluck, E. (2012). "The impact of redistribution on income inequality in Canada and the provinces, 1981–2010." Centre for the Study of Living Standards Working Paper, September.

Shorrocks, A.F. (1983). "The impact of income components on the distribution of family incomes." Quarterly Journal of Economics 98: 311–326.

Short, K. (2001). Experimental Poverty Measures: 1999, P60-216, Washington, DC: US Census Bureau.

Short, K. (2012). The Research Supplemental Poverty Measure: 2011, Current Population Reports: P60-244, Washington, DC: U.S. Census Bureau, November. At http://www.census.gov/prod/2012pubs/p60-244.pdf.

Simons, H.C. (1938). Personal Income Taxation: The Definition of Income as a Problem of Fiscal Policy, Chicago: University of Chicago Press.

Slemrod, J. (1996). "High-income families and the tax changes of the 1980s: the anatomy of behavioral response." In Empirical Foundations of Household Taxation, M. Feldstein and J. M. Poterba (eds), Pp. 169–189, Chicago and London: University of Chicago Press.

Slesnick, D.T. (1994). "Consumption, needs and inequality." International Economic Review 35: 677–703.

Smeeding, T.M. (1982). "Alternative methods for valuing selected in-kind transfer benefits and measuring their effect on poverty." US Bureau of Census Technical Paper no. 50, Washington, DC: US Government Printing Office.

Smeeding, T.M, O'Higgins, M., Rainwater, L. (1990). Poverty, Inequality and the Distribution of Income in an International Context: Initial Research from the Luxembourg Income Study (LIS) Project. London: Wheatsheaf Books; Washington, DC: Urban Institute Press.

Smeeding, T.M., Rainwater, L., Burtless, G. (2000). "United States poverty in a cross-national context." Mimeo, Center for Policy Research, Syracuse University, Syracuse, NY, August.

Smeeding, T.M. (2004). "Twenty years of research on income inequality, poverty, and redistribution in the developed world: Introduction and overview." Socio-Economic Review 2: 149–163.

Smeeding, T.M. (2005). "Public policy, economic inequality, and poverty: the United States in comparative perspective." Social Science Quarterly 86(supplement): 955–983.

Smeeding, T.M. (2006). "Poor people in rich nations: the United States in comparative perspective." Journal of Economic Perspectives 20: 69–90.

Smeeding, T.M., Weinberg, D.H. (2001). "Toward a uniform definition of household income." Review of Income and Wealth 47: 1–24.

Smeeding, T.M., Rainwater, L. (2004). "Comparing living standards across nations: real incomes at the top, the bottom, and the middle." In E. N. Wolff (Ed.), What Has Happened to the Quality of Life in the Advanced Industrialized Nations?, Pp. 153–183, Northampton, MA: Edward Elgar.

Smeeding, T.M., Saunders, P., Coder, J., Jenkins, S., Fritzell, J., Hagenaars, A.J.M., Hauser, R., Wolfson, M. (1993). "Poverty, inequality, and family living standards impacts across seven nations: the

effect of noncash subsidies for health, education, and housing." Review of Income and Wealth 39: 229–256.

Smeeding, T.M., Brandolini, A. (2009). "Inequality in richer and OECD countries." In W. Salverda, B. Nolan, T.M. Smeeding (eds), The Oxford Handbook of Economic Inequality, London: Oxford University Press.

Smeeding, T.M., Thompson, J. (2011). "Recent trends in income inequality: labor, wealth, and more complete measures of income." Research in Labor Economics 32: 1–50.

Smeeding, T.M., Thompson, J. (2007). "Income from Wealth and Income from Labor: Stocks, Flows and More Complete Measures of Well Being." Unpublished manuscript, June.

de Souza, P.H.G. Ferreira (2012). "Poverty, inequality, and social policies in Brazil, 1995–2009." Working Paper No.87, International Policy Centre for Inclusive Growth United Nations Development Programme, February.

Statistics Netherlands (2012). Prosperity in the Netherlands, May 14, 2012.

Summers, R., Heston, A. (1991). "The Penn World Table (Mark 5): an expanded set of international comparisons, 1950–1988." Quarterly Journal of Economics 106: 327–368.

Thompson, J., Smeeding, T.M. (2013). "U.S. country study." In S. Jenkins, A. Brandolini, J. Micklewright, and B. Nolan (eds), The Great Recession and the Distribution of Household Income, Oxford: Oxford University Press.

Tóth, I.G. (forthcoming). "Zooming into grand inequality narratives: lessons from a transversal analysis of in depth studies on medium term inequality trends in 30 countries." In W. Salverda, et al. (eds) Changing Inequalities and Societal Impacts in Thirty Rich Countries: Thirty Countries' Experiences, Oxford: Oxford University Press.

Townsend, P. (1979). Poverty in the United Kingdom. Harmondsworth: Penguin.

Townsend, P. (1993). The International Analysis of Poverty. London: Harvester Wheatsheaf.

UNICEF Innocenti Research Centre (2000). A League Table of Child Poverty in Rich Nations. Innocenti Report Card 1, UNICEF, Florence, June, at http:///www.unicef-icdc.org.

United Kingdom Department of Social Security (1993). Households Below Average Income. London: Government Statistical Service.

United Nations Development Programme (1999). Human Development Report. New York: United Nations, July.

United Nations University-World Institute for Development Economics Research (2007). World Income Inequality Database V 2.0b May 2007, available at http://www.wider.unu.edu/wiid/wiid.htm.

US Congressional Budget Office (2007). Historical Effective Federal Tax Rates: 1979 to 2005. December, available at: http://www.cbo.gov/ftpdocs/88xx/doc8885/12-11-HistoricalTaxRates.pdf

Van Praag, B. (1968). Individual Welfare Functions and Consumer Behavior. Amsterdam: North-Holland.

Veall, M. (2012). “Top income shares in Canada: Recent trends and policy implications.” Canadian Journal of Economics 45(4): 1247–1272.

Voitchovsky, S. (2005). “Does the profile of income inequality matter for economic growth?” Journal of Economic Growth 10: 273–296.

Wang, C., Caminada, K. (2011). “Disentangling income inequality and the redistributive effect of social transfers and taxes in 36 LIS countries.” Luxembourg Income Study Working Paper No. 567, July.

Williamson, J.G., Lindert, P.H. (1980). American Inequality: A Macroeconomic History. New York: Academic Press.

World Bank (2005). World Development Report 2006: Equity and Development. New York and Oxford, Oxford University Press.