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Welfare State Expenditures and the Redistribution of Well-being:  
Children, Elders, and Others in Comparative Perspective

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## **Abstract**

This paper describes the size, nature, and redistributive effects of welfare state expenditures in ten advanced industrialized nations and relates these differences across nations to disparities in the economic well-being of country populations as a whole and three (mutually exclusive and exhaustive) sub-groups: children (and their families); elders; and childless adult households. Data from the Organization for Economic Cooperation and Development (OECD) are used to describe differences in the size and nature of welfare states. The OECD health, welfare and education benefits data are combined with micro data on household incomes from the Luxembourg Income Study (LIS) to assess their distribution and finance across the income distribution in ten countries. The results indicate a wide range of differences in levels of economic resources and support, within as well as between, nations and groups. Counting in kind benefits at government cost substantially reduces cross national differences in market and cash disposable incomes, but does not eliminate them. But the results are very sensitive to how in-kind benefits, especially health insurance, are measured and valued and call into question the extra-ordinarily high US expenditures on health care.

## I. Introduction

The purpose of this paper is to describe the size, nature, and redistributive effects of welfare state expenditures in ten advanced industrialized nations and to relate these differences across nations to cross national differences in within country disparities in economic well-being. Efforts are made to provide a decent standard of living and access to health care for the elderly in every modern rich nation. Elders are major beneficiaries of social retirement and health care benefits and the cost and benefits of policies for aging populations are fiscally important in every rich nation. (Forster, et. al., 2004; Binstock, et. al. 2002). Equality of opportunity for children and a fair chance at life's opportunities are something that all nations aspire to provide to each and every child. These policies affect human development and human needs, social exclusion or inclusion, and the way that we judge societies more generally. President Bush in America has vowed to "leave no child behind," while Prime Minister Blair in the United Kingdom has vowed to halve child poverty in ten years and eliminate it in twenty (Bradshaw 2003). The belief that every person should be provided with a decent education, basic health care, and a satisfactory standard of living permeate the United Nations Human Development Reports and their Millennium Development Goals. These goals echo Amartya Sen's notion that every person should be provided with capabilities to succeed in life be they old, young or in between (Sen 1992) and reflect what policy analysts have historically termed the "social wage" (Rainwater, 1974).

The nations we choose to investigate here include representatives from each of the three worlds of welfare capitalism identified by Esping-Anderson (1990) and even earlier by Kamerman and Kahn (1978): the four largest predominately English speaking nations, Australia, Canada, the United States, and the United Kingdom, four continental European nations Belgium,

France, Germany, and the Netherlands, and two Scandinavian nations, Finland and Sweden. We doubt that inclusion of additional rich OECD nations would change the patterns we find here.

For each country, we begin with market income and rank the population of all households by equivalent household market income. We then add cash transfers and non-cash benefits for health care and education, including early childhood education (all valued at government cost) and subtract the taxes paid to finance these social transfers for the entire population. Total transfers just equal taxes for the whole population. The LIS data give us good estimates of the distribution of cash expenditures and income and consumption data allow us to do relatively accurate simulations of the tax burdens across income classes. We assume equal distributions of publicly financed health and education expenditures in all nations. Only employer provided health care in the United States differs in this regard.

Post direct-tax, post cash transfer incomes, which we call cash disposable income, is the usual measure of well being offered in comparative terms (Atkinson, Rainwater and Smeeding 1995). But we go far beyond that measure here. Post- all tax, post -all transfer income, which we call “full income,” is a more comprehensive measure than disposable income. In the past, the difference between market income and disposable income has been used as a crude accounting measure of the redistributive effect of cash welfare state expenditures. The difference between market income and full income is a better measure than the difference between market income and disposable cash income for assessing the efforts of welfare states to redistribute opportunities and access to critical goods for human development and well-being. Differences between market and full income across the income distribution are also a more comprehensive measure of the relative costs (in terms of taxes paid) and value of benefits in different countries than are differences between market and disposable income.

To the extent that the transfers we add induce changes in work, savings, or marriage behavior, our measure of net transfers may be biased. Moreover the measure reflects transfers over the life course as well as transfers across lifetime or permanent income groups (see Paglin 1975; Falkingham and Hills 1995). We address this issue to some extent by presenting separate estimates for the aged, families with children, and all others. Thus, the net transfer estimates are useful first approximations of the net redistributive effects of the welfare state.<sup>1</sup>

Linking the welfare state “inputs” of cash, education, and health transfers to “outputs” such as health status, quality of life, educational attainment, and economic and social well-being, is the ultimate test of the success or failure of these efforts (For instance, see Phipps 2004). Our aim in this paper is less ambitious: to measure the degree to which social welfare expenditures, including health and education expenditures, close the gap in economic resources afforded to poor versus middle-income and poor and middle income versus rich adults, children and elders in rich countries.

## II. Data and Methods

We use several data sources compiled by the Organization for Economic Cooperation and Development (OECD) and others (Gornick and Meyers 2003) to construct our measures of welfare state expenditures. Most of the aggregate public expenditure data is derived from the *OECD 1980-1998: 20 Years of Social Expenditure – the OECD Database* (2002c), with the exception of education data, which is derived from *OECD Education at a Glance* (2002b) and early childhood education (ECE), which come from Gornick and Meyers (2003). The *OECD Social Expenditure Database* includes the following categories of social benefits: old-age cash benefits; disability cash benefits; occupational injury and disease; sickness benefits; services for

the elderly and disabled; survivors; family cash benefits; family services; active labor market policies; unemployment compensation; housing benefits; public health expenditure; and other contingencies (e.g., cash benefits to those with low income). Such benefits may be cash transfers or the direct in-kind provision of goods and services. A detailed rationale for, and accounting of, these benefits is provided in *The OECD Social Expenditure Database 1980-1997* (2002c). Employer provided benefits and aggregate tax expenditures are also derived from data compiled by the OECD and the Employee Benefit Research Institute (EBRI 2004; Adema 2001).

The OECD categories are re-arranged as follows: pensions include old age, disability, survivors insurance and employer provided pension benefits; health includes public health expenditures (Medicare and Medicaid in the United States) and employer provided health benefits; education includes public expenditures on formal day care, primary, and secondary education as well as Head Start in the United States. Other cash transfers include occupational injury and disease, sickness, unemployment compensation, family allowance, parental leave, other contingencies, child welfare, family cash benefits and tax breaks for social purposes that are similar to cash<sup>2</sup>, other in-kind benefits include services for the elderly and disabled, family services (food stamps, low income home energy assistance, women and children nutrition programs) and active labor market programs; and housing includes cash housing subsidies for countries other than the United States and public housing and housing vouchers in the United States.

While data on public benefits encompasses expenditures paid and controlled by all levels of government (federal, state and local), the quality of the data varies across countries, particularly with respect to lower tiers of government (OECD 2002c). The country data is also limited with respect to housing and tax expenditures. The OECD housing data includes only cash

expenditures; in-kind and tax expenditures for housing are omitted. Therefore we do not include housing tax expenditures for the United States. Tax expenditures in general are not included in the micro data presented here, except as they are already reflected in the lower taxes which LIS households pay. Similarly, we are not able to easily identify the families of origin of students in higher education and are therefore unable to accurately distribute post-secondary education benefits. On the other hand we include the full range of available ECE benefits, not only Head Start and larger national programs.

The micro data that we use for this analysis are from the Luxembourg Income Study (LIS) database, which now contains over 135 household income data files for 29 nations covering the period 1967 to 2002 ([www.lisproject.org](http://www.lisproject.org)). For this paper, as noted above, we limit the analysis to ten nations, and their most recent datasets. Within each country, we begin with the LIS measure of household market income (earnings plus private pensions and income from assets) and add employer payroll taxes (and in the United States, employer provided health insurance) to earnings in order to get a pre-tax, pre-transfer estimate of market income.<sup>3</sup>

For cross-national comparisons of inequality, the household is the single best unit for income aggregation. It is the only comparable income-sharing unit available for most nations. While the household is the unit used for aggregating income, the person is the unit of analysis. Household income is assumed to be equally shared among all individuals within a household. A variety of equivalence scales have been used in cross-national comparisons, in order to make comparisons of well-being between households with differing compositions. We adjust household incomes to reflect differences in household size by dividing income by the square root of household size as this measure does not unduly bias measures towards large units (with children) or smaller units (with elders) (Atkinson, Rainwater, and Smeeding 1995).

## **Imputations**

We then add cash transfers and non-cash benefits for health care and education, including early childhood education (all valued at government cost) and subtract the taxes paid to finance these social transfers. This measure of full income is then divided by the square root of household size to obtain equivalent full income per person. Within each country, the taxes subtracted from income equal the social transfers received for the population as a whole. (Though taxes and benefits are equal for the entire population within each nation, our sub-group analysis focuses on households with elders or children or only adults, where taxes paid may be less or more than transfers received). The LIS data give us good estimates of the distribution of cash expenditures and the income and earnings data, along with consumption data for several countries, allow us to do relatively accurate simulations of the tax burdens across income classes. Payroll taxes are assumed to be proportional to individual earnings up to maximums, which vary across countries. Property taxes are assumed to be proportional to housing consumption for both owners and renters. Sales and value added taxes are assumed to be proportional to total consumption. Decile specific consumption to income ratios are taken from micro data surveys for four nations (Canada, France, the United Kingdom, and the United States) and an average of the four is applied to other nations. Appendix A describes the tax simulation in more detail.

With the exception of health in the United States, we assume an equal distribution of health and education expenditures across the income distribution within all nations. We use OECD estimates of health care spending per capita and elementary education and secondary education spending per enrolled person taken from their *Health Data* (OECD 2002a) and *Education at a Glance* (OECD 2002b) databases for each nation. Based on recent cross-national research on the cost of health care by age groups in OECD countries (Smeeding and Freund

2002), we assume health care spending for children 18 years old or less is equal to .75 of the average government cost of subsidized health care per capita (or government plus employer subsidized health care in the United States) and 1.0; 1.25; 1.75; 3.0; and 4.0 times the average, respectively, for adults aged 19-34; 35-54; 55-64; 65-74; and 75+ in each nation. This measure is often called the “insurance value” of benefits, because it measures the amount of money per person of each age type that would have to be paid in to just cover benefits received by that group (Smeeding, 1982). Each person of a given age receives this benefit regardless of actual health care usage.

Because the United States, alone among the nations examined, does not have a universal national health insurance or health service, the imputations were more complicated. Using data from EBRI and the Center for Medicare and Medicaid Services (CMMS) on overall average expenditures per covered recipient, and the percent of individuals in each quintile of household income who are recipients of charity benefits as uninsured, or who are insured by their employer, or by Medicare or by other public programs (principally Medicaid), the average expenditure per person in that quintile is imputed (and then adjusted for the age of the individual as specified above to get to the insurance value). For uninsured persons, we imputed a lower amount consistent with the amount of unpaid care received by the uninsured in the 1998 Medical Care Expenditure Survey (MEPS) as provided by Barbara Wolfe (2002). Expenditures for care provided to the uninsured are, on average, about half the amount provided to an insured person. Employer benefits were derived from EBRI estimates. Medicaid and Medicare figures were taken from the *Green Book* (U.S. Congress 2004) and from the CMMS webpage.

Education spending is set equal to the spending per elementary and secondary school child in every country as estimated by OECD (2002b). Finally, we utilize OECD data and data

from Gornick and Meyers (2003) and Meyers (2003) to add the value of early childhood education expenditures (for children between the ages of three and school starting age, normally 5 in most nations).

For the LIS simulations we ignore tertiary education benefits and all other non-cash benefits for youth including child care subsidies for children under age three.<sup>4</sup> Omitting tertiary education is a serious limitation, but the LIS provides insufficient data to allow us to impute its value to families. Elementary and secondary education and health care cover the vast majority of children's non-cash benefits in every nation studied. Similarly, hospital and physician and pharmaceutical services provided to the elderly make up the bulk of their health care subsidies. We also implicitly include the insurance value of publicly provided nursing home services for the non-institutionalized population from the Medicaid program in the United States and for publicly provided chronic care in other nations as well. See appendix for more detail on these imputations and sources.

### **Measure of Redistributive Effects**

For each country as a whole, the benefits and taxes are equal across the entire population. In this paper, we present results for all households, for those with children (under 18), for the elderly (over 65), and for households without children headed by a non-elderly person<sup>5</sup>.

The difference between market income and post-tax, post transfer incomes by decile is a crude accounting measure of the redistributive effect of welfare state expenditures. To the extent that the transfers induce changes in work, savings, or marriage behavior, this measure is biased. But it is a useful first approximation. The difference between market income and post-tax, post transfer income, which we call full income, is a better measure than the difference between

market income and post-tax, post transfer disposable cash income for assessing the efforts of welfare states to redistribute capabilities, access to services and opportunities. All taxes are included in full income, especially indirect ones such as the value added tax (VAT) as well as the largest and most visible non cash benefits in the form of health care and education. Differences in full income across the income distribution are therefore a better measure of fiscal effects of governments on the relative well-being in different countries than are differences in cash incomes. (At the end of the analysis, we examine the sensitivity of our results to alternative valuations.)

We use these data to compute the full income of a low-income, the median-income, and a high-income person in each nation. The low-income person is measured at the 10<sup>th</sup> percentile (median of the bottom quintile) while the high-income person is measured at the 90<sup>th</sup> percentile (median of the top quintile) of full income. We further refer to the difference between persons living in families with high- and low- full incomes as “economic distance” in making the comparisons which follow. We like to think of the measure of economic distance as a measure of equality of provision (for adults and elders) or equality of opportunity (for children) within each nation. Nations with smaller economic distances (or smaller decile ratios) have more “equality of provision” or “equality of opportunity” across the population. We also like to focus on the distance between the middle-income person and the low-income person as a measure of “provision for the poor” for adults and elders, or “fair chance” for children. All of this is designed to show which nations provide critically important social goods, like health care, for elders and adults. For children, they show which nations might leave their children behind, which ones give them a good start, and by how much.

### **III. Differences in Welfare State Expenditures among Ten Advanced Industrial Nations**

Figure 1 displays aggregate social welfare benefits as a proportion of the Gross Domestic Product (GDP) for each of the ten nations we examine. Social welfare benefits are defined to include employer provided health insurance and retirement benefits and some tax expenditures.<sup>6</sup> Although other nations also have employer provided retirement pensions, the United States private system is larger and none, save the United States, has employer provided health insurance.<sup>7</sup> Two facts about gross expenditures stand out.

First, all of the countries spend a substantial fraction—at least one fourth—of their GDP's on social welfare. When social welfare benefits are added to exhaustive government outlays (as in the Systems of National Accounts) as a measure of total government spending, social benefits are at the very least 68 percent of government outlays (Australia) and up to 90 percent (Sweden) of total outlays (Osberg, Smeeding and Schwabish, 2004). Most of what governments do--tax one set of persons and transfer benefits to another-- is therefore represented in Figure 1.

Second, though there is some variation within the English speaking countries, in the broader context of the continental West European and Scandinavian nations, the differences among the English speaking nations are relatively small compared to the differences between the English speaking nations and the continental European and Scandinavian nations. Within the English speaking group, the United States spends nearly as much as the United Kingdom, and more than Canada and Australia. If employer provided health insurance and pensions are subtracted, the United States spends the least and total social welfare expenditures would amount to only 20 percent. However measured, however, the English speaking nations spend the least,

the European nations substantially more, and the Scandinavian nations spend the most. These patterns are consistent with findings of other comparative studies (Kamerman and Kahn 1978; Smeeding, O'Higgins, and Rainwater 1990; Esping-Andersen 1990; Smeeding 2004). Most of these cross national differences are attributable to history, culture, and political choices rather than to income or demography. The Scandinavian countries have strong labor movements and social democratic parties that are committed to reducing class and gender inequalities. Germany, dating back to Bismarck has been a big welfare state spender and more generally, the continental European countries have strong Catholic parties that after World War II, when faced with the threat of Communism, became committed to providing security for the population through a corporatist social structure (Lindert 2004). The English speaking countries have a strong 19<sup>th</sup> century liberal belief in limited government (Kamerman and Kahn 1978; Esping-Andersen 1990; Hollingsworth, Schmitter, and Streeck 1994; Gornick and Meyers 2003; Huber and Stephens 1999).

Figure 2 displays the two major domains of welfare state expenditures: cash and non cash (mostly health and education) spending. Each country is represented by two bars except for France where net cash estimates are not available. Each represents the division between cash and in kind benefits. In the first, cash benefits are measured on a gross basis while in the second, cash benefits are valued according to their worth to citizens. Noncash benefits are measured the same in both groups. Three points stand out from Figure 2. First, both bars indicate that non cash spending amounts to roughly from 40 to 60 percent of total welfare state spending! In view of the large size of health and education expenditures (and to a lesser extent, other in-kind benefits) studies that take account of only cash transfers are omitting about half of what the welfare state does.

Second, the Anglo Saxon nations, and particularly the United States, spend relatively more on non cash benefits than do the other nations. Americans are small spenders in cash support, but big spenders on education and especially health care. Indeed the most striking feature of American social expenditures, compared with other industrialized countries, is how much more is spent on health care. More than a third of United States social expenditures are spent on health care; with 20 percent in the next nearest country!<sup>8</sup>

Third, the value of cash transfers to citizens of different countries will differ depending upon the mix of taxes in the country. Scandinavian and continental European countries are more likely to tax cash transfers and to finance social welfare expenditures through indirect taxes than the English speaking countries, and hence it is important to capture their effects as well as those of direct (payroll and income) taxes. The value added tax which may be thought of most simply as a variant of a sales tax is close to 20 percent in most Scandinavian and continental countries, as compared to about 6 percent or 7 percent in the US. A cash transfer of \$1000 in the US buys \$930 to \$940 worth of goods. In Europe it therefore buys only about \$800 worth of goods and services. The English speaking countries, the United States relies least on indirect taxes and is also least in taxing cash transfers under its income tax. If one measures the net value of cash transfers rather than the gross value, differences across countries shrinks considerably as seen in the second bar for each country in Figure 2.

Though we do not attempt to estimate the effects of other in-kind benefits, we make a first attempt at incorporating in-kind benefits into the comparative analysis of welfare states by taking account of health and education expenditures in our estimates of how the welfare state affects resources and opportunities.<sup>9</sup> We also take account of the indirect as well as direct taxes to measure net values of cash transfers.

## IV. The Redistributive Effects of Expenditures and Taxes

Having established that in kind benefits constitute a substantial part of all welfare states, are especially large in the English speaking welfare states, and are largest of all in the US, we investigate next the degree to which in kind benefits affect the distribution of resources within countries and cross country comparisons of distributional patterns. As explained above, we examine only a subset of the social welfare benefits displayed in Figure 1. In particular, public housing and some other in-kind benefits, like higher education benefits, are omitted from the analyses below.

Table 1 panels A-D display the mean net benefits as a percent of equivalent full income by household quintiles for all households. For the entire population, taxes levied equal total benefits, including benefits for the aged as well as children. Panel A displays the results for all persons and, consequently, net benefits, displayed in the far right hand column, equal zero. The 80.4 percent figure in the first column of the first row, for example, indicates that in Australia net transfer benefits are 80.4 percent of full income in that quintile. Similarly, the -30.5 percent figure in the next to last column of the first row indicates that in Australia, the average person in the fifth quintile loses nearly 30.5 percent of full income as a net result of welfare state transfers and taxes.

Several findings stand out from the top panel of the table. First, in all of the countries, welfare state benefits, net of taxes, substantially and systematically redistribute resources away from the top towards the bottom of the income distribution. The redistribution effects of net social welfare transfers have the same pro-poor pattern in all nations, differing only by degree, not direction. The middle quintile is always a net beneficiary. On average in the middle, taxes paid are less than benefits received by 11 percent. The fourth quintile pays taxes which average a

modest 6 percent of full incomes. The majority of the net costs of supporting the welfare state are paid by the top income persons in each nation.

Second, the increase in resources available to persons in the bottom full income quintile is very large. That, on average, 53 percent of full income is net transfers indicates that welfare states more than doubles market incomes in this quintile. The increases are large because the bottom quintile in all countries consists primarily of elderly and single mothers who have no or very low market earnings and high social welfare benefits.

Third, in all countries the taxes required to finance welfare state benefits take away a non-trivial proportion of resources from families in the top quintile—on average 23 percent of full income, and ranging from 16 percent to 31 percent. Finland, the United States, France and the Netherlands take away the least. Perhaps the most surprising finding in the table is that the Finland takes away least and Australia, Belgium and United Kingdom the most from the top quintile. The difference between France and Belgium or France and the Netherlands, is also surprising.

The figures for families with children, elderly, and non-elderly without children are contained in panels B, C, and D. By examining redistribution within and across these groups, we are able to better isolate redistribution across the life cycle versus redistribution by income class. The pattern of redistribution for children looks much like the pattern for all persons—progressive redistribution up the income scale with the top quintile being net taxpayers in all nations—with net taxes of 19.2 percent of full income. The last column of the table indicates that in most countries families with children receive in benefits about what they pay in taxes. Though the variations are not extremely large (compared for example to the transfers to the aged discussed below) the differences across countries are interesting. Families with children in Belgium and

France are net taxpayers—that is taxes exceed full incomes by over 10 percent in each while such families in Finland, the United Kingdom and the United States are surprisingly net gainers. In fact, United States children are net gainers at least until the 80<sup>th</sup> percentile, the highest of any nation. This is because of relatively higher United States education benefits and health benefits. That French children are net taxpayers, despite the relative generosity of the French towards children (Bergman 1997), suggests that there must be a lot of social support for other groups in France.

Elders, as panel C indicates, are everywhere net beneficiaries of the welfare state and this is nowhere more truly so than in France. Here elders are net transfer recipients to the tune of over 80 percent of their net incomes! Across all nations, elders average 54.8 percent of their final full incomes in net transfers. Benefits are least in the nations with the strongest occupational (private) pension schemes: Finland, and the United States and the Netherlands. They are largest where public pensions are large—France Belgium, Sweden and Germany. In the other cases, strong welfare state benefits and private pensions lead to a middle case (Netherlands, Canada and the United Kingdom). These results suggest, not surprisingly, that the welfare state, as currently operating in all the rich nations examined here, provides a very large net transfer to the aged.

Panel D of Table 1 indicates that the childless are net taxpayers in all societies, averaging 21.9 percent in net taxes. The second quintile is the average tipping point, where benefits just equal taxes. Above this level the top three quintiles exhibit net taxes in every nation. Because the overwhelming majority of individuals in all of the countries we examine, have children at some point in their life, the transfers away from the childless to the elderly should be viewed as reflecting primarily redistribution across the life cycle.

In sum, welfare states are large engines of redistribution. The bottom three quintiles and elders are net beneficiaries in all societies. The richest fifth of the population and the non-elderly childless pays for the bulk of net transfers.

## **V. Relative Well-Being within Countries**

To replicate prior research and thereby tie this analysis to earlier work on income distribution, we begin our analyses with cash disposable income, which adds to market income cash and near-cash (those denominated in dollars like Food Stamps in the US and cash housing allowances in Sweden) transfers and subtracts direct taxes. Panels A and B in Figures 3, 4, 5, and 6, present data on the distribution of cash disposable incomes and full incomes respectively for all persons, households with children, the elderly and childless adults. The first column presents the ratio of incomes of the person (child, elder, childless adult) at the 10<sup>th</sup> percentile compared to the income of the person (child, elder, childless adult) at the median. Panel C is discussed in the next section.

At 39, the United States has the lowest ratio of low to middle incomes (P10/P50) in panel A of Figure 3. The ratios for the other English speaking nations range from 45 to 47. The continental European nations have ratios in the low to mid 50's and the two Scandinavian nations have ratios of 57. Similarly, the ratio of the 90<sup>th</sup> to the 50<sup>th</sup> percentile are generally highest in the English speaking countries and lowest in the Scandinavian countries, with the United States and United Kingdom having the greatest distance between the median and upper-income person. Finally, the economic distance between the person at the 10<sup>th</sup> percentile and the person at the 90<sup>th</sup> percentile—our measure of an equal opportunity for children and equality of

provision for others—is greatest in the United States, with the person at the 90<sup>th</sup> percentile having 5.43 times the income of the person at the 10<sup>th</sup> percentile. The other English speaking nations have ratios of 3.99 or greater; the continental nations have ratios in the mid to low 3's; and the Scandinavian countries have ratios in the high 2's. These patterns conform to previous LIS research (Rainwater and Smeeding 2003; Smeeding 2004a).

Panel B of Figure 3 presents data on the distribution of after tax, after transfer, full incomes in our ten nations. Taking account of non-cash transfers and the indirect as well as direct taxes required to finance those changes the results substantially. The 10/50 ratio rises in all countries and, except for Finland which was already very equal, the distance between the poor and the rich shrinks in all countries. Changes are largest among the English speaking nations. Here, though the United States still has the largest 90/10 ratio, it has fallen by a large amount, from 5.43 to 3.65. Large declines are also found in Australia and the United Kingdom and even in Canada. The largest changes are in the 10/50 ratios, especially for the United States. And while the English speaking nations still have the lowest 10/50 ratios, and the Scandinavian countries the highest, the differences between these groups have shrunk considerably. The differences in the 10/50 and 90/10 ratios between the least and most unequal countries—the United States and Sweden—shrink as well. In fact, the 10/50 ratios are now in a tight band--varying from 52 to 58 percent. The range and distances at the top (90/50) also drop, but difference between the United Kingdom and the United States compared to the others remain substantial.

Why do the results change so dramatically when we include the value of the in-kind education and health benefits and take account of the taxes required to finance these benefits? There are two reasons, both already discussed. First, as seen in Figure 2, compared to other

advanced industrialized nations, the United States is short on cash and long on in-kind benefits. Second, as seen in Figure 2, the big spending welfare states rely more heavily on indirect taxes and taxation of cash benefits than the United States. Together, these two factors explain the big shift when we go from cash disposable income to full income. And similar patterns are found in other English speaking nations. Indeed, one can argue that health and education benefits are a substitute for cash in these nations, more so than in the European and Scandinavian nations which spend large amounts on both cash and non-cash benefits.

Figures 4-6 show the patterns of redistribution for the three subgroups. Children's 10/50 ratio is low in the United States relative to other children—39—but rising to 58 once non cash benefits are counted. Still the United States is below average for kids (61) and is second to Canada which has only a 10/50 ratio of 54; but the United States is much closer to the others on a full income basis than on a cash disposable income basis. The 90/10 ratios for kids fall even more in the United States than did the overall 90/10 ratios—from 5.24 in cash, to 3.14 after education and health care are counted. Both of these benefits appear crucial to child well being and equality of opportunity in every nation.

Similar equalization is found among the elders (though the United States' 90/10 ratio still remains far above all others) in Figure 5. On a full income basis the 90/10 for elders exceeds that for children in every nation except the United States where both are at 58. But here the US elders are still the lowest among all nations studied, much closer to the median than on a cash only basis, but still with a 10/50 ratio far below the overall average of 66. United States well to do elders continue to be far above other elders in relative terms. Non elderly adults without kids are the least well off group in all countries at the 10/50 ratio, owing to the fact that they receive less

net benefits and that their comparison distribution is filled with single persons who do not earn much at all.

### **Sensitivity of Results to Valuations of in-kind benefits**

The results in Panels A and B in Figures 3-6, may be sensitive to a number of assumptions underlying the simulations, including: 1) cross national differences in expenditures on health and education measure real differences in quantity of services, 2) non-cash benefits are the same value for rich and poor and 3) government cost is a good measure of the value of benefits to recipients.

The valuation of in-kind benefits is particularly knotty in cross-national research. As we have seen, the United States spends substantially more on health (and to a lesser extent, more on education) than all other nations. Anderson et al. (2003) suggests that the United States is below the OECD median in terms of health service use, but with total health care spending per capita (\$4,631 in 2000 dollars) that is more than twice the OECD median (\$1,983). Americans pay more but receive fewer health care services in return than do people in most OECD nations. In large, part the differences in health care are attributable to higher relative and absolute salaries of doctors, nurses, and other personnel in the United States (Anderson et al. 2003). It is hard to believe that the differences in expenditures for health care translate dollar for dollar into differences in the quantity and quality of services received. One simple way to address this issue empirically is to assume that the quantity and quality of health and education services is the same across nations. Thus, we simulated equal benefits of education and health across nations, using the mean benefit across nations, but preserving the difference in financing costs. This has the effect of discounting the value of United States health and education benefits.

The results for equal benefit value across all nations' scenario are presented in panel C in Figures 3 through 6 and the results for all three scenarios--disposable income, full income, and equal benefit value are summarized in Table 2. Because education affects only families with children and health care disproportionately affects the aged, Table 2 presents results only for families with children and the elderly. To simplify the analysis, we also present results only for the 10/50 and 90/10 ratios.

For families with children (Figure 4 and table 2, panel A), the equal benefit results are closer to the full benefits simulation, indicating that even if the value of education and health services received by children in the US is equal to only the average value of services received in other countries, counting them makes a large difference in relative resources across all nations and especially for United States children. Under all scenarios examined for families with children, taking account of health and education expenditures substantially reduces differences among nations in general and improves the position of United States in particular. The remaining differences between the English speaking, continental, and Scandinavian countries are large enough to make us confident that they are real. But, among the English speaking nations, the differences are small enough relative to our knowledge regarding distributions of expenditures and the appropriate valuation of expenditures to give us pause.

For elders (Figure 5 and Table 2, panel B), however, the equal benefit results are much closer to the disposable income results. Indeed, the 10/50 ratios for disposable income and equal value benefits simulations in the US for the elderly are virtually identical. These results for the elderly clearly prompt the question: Is the US getting its money worth from the vastly disproportionate amount of resources we are devoting to health care expenditures for this group?

With respect to the second assumption—that benefits are distributed equally across income classes, for the United States, for example, we take some account of differences in spending for health (public vs. employer vs. uninsured). We take no account for children’s education. If school spending (relative to children’s needs) is lower for low-income children compared to high-income children, the result might be somewhat different. Card and Payne (1998), Wilson (2000), and Duncombe and Yinger (1997) find that public school spending in the United States may differ by up to 50 percent between rich and poor districts. Wilson, Lambright and Smeeding (2004) find that while per student benefits differ across the parental income distribution by only about 10 percent, when corrected for differences in needs due to poverty, disability and English as a second language, benefits for top quintile children are 25 to 30 percent larger than for poor children. If poor children received education benefits of only two thirds to half those received by rich children, the results for the United States children would be much closer to the results shown for cash alone (Panel A vs. Panel B in Figure 5). The sensitivity of our US results points to the need to undertake research on differences in expenditures on health and education within countries by income class (as in Wilson, Lambright, and Smeeding 2004) because expenditures on schooling are likely to differ by income class in other countries besides the United States and we have no evidence of by how much..

Even if the expenditures were equal across income classes, the value of benefits might differ by income class. For example, per pupil expenditures in some inner city American schools are equal to and, in some cases, higher than expenditures in their suburban counterparts. But the inner city schools have inferior physical plants, inferior teachers, more difficult to educate students, and more disciplinary problems resulting in unequal learning opportunities (Phillips and Chen 2003). Similarly, the quality of health care varies substantially within cities where

Medicaid financed low-income clinics and public hospitals deal with different populations than do their suburban counterparts. It is not clear how to address these issues empirically.

More generally, it is not clear that expenditures should be valued at government cost. On the one hand, economists generally assume that in-kind benefits are worth less to recipients than the cash equivalent value would be. These differences are liable to be the largest where the ratio of in-kind to cash income is the largest, among poor families. Since the 10/50 ratio for low-income persons rises from 39 to 53 percent for all persons (Figure 4), while that for children rises by almost 50 percent (from 39 to 58 in Figure 5) and for elders by almost as much (from 42 to 58), once these benefits are added in, the differences between market value (government cost) and recipient value are liable to be largest for low-income families. And because high-income units are net taxpayers and are also more mobile than are low-income families, one should assume that the high-income family values education and health benefits closer to their market value (government cost).

On the other hand, it could be argued that we have underestimated the value to children of the in-kind benefits because though education is targeted exclusively at children, we add the value of education to household disposable income and then divide by the square of household size to obtain equivalent income per child. Arguably, it would be more appropriate to add the value of education per child to equivalent disposable income. Doing so would give even more weight to the in-kind benefits. Similarly, some benefit cost analyses suggest that the value of health benefits may be greater than their cost. (Cutler, 2004). Furthermore, Medicare creates direct insurance benefits for elders. Finkelstein and McKnight (2005) find that Medicare has created reductions in out of pocket expenses of about 40 percent for the top quartile of out of pocket spenders, and has therefore greatly reduced risk exposure amongst the elderly. The gains

from this reduction in insecurity--aside from any positive health effects-- may be sufficient to cover between half and three-quarters of the costs of the Medicare program. Finally, our valuations take no account of the external benefits of health and education. Future research should endeavor to systematically examine the implications of alternative valuations of in kind transfers.

## **VI. Summary and Conclusion**

In this paper we investigate the size, nature, and redistributive effects of welfare state expenditures in the US and nine other advanced industrialized nations using both aggregate social welfare and education expenditure data from OECD and micro data from LIS. The major innovation is to include in kind benefits of education *and* health care in the analyses. Seven major findings stand out and contradict previous perceptions about cross national differences in social spending and well-being and the policy inferences which flow from these. First, social welfare expenditures are large in all advanced industrialized nations. In the United States, depending upon whether employer provided benefits are counted or not, such expenditures amount to from just a bit more than a fifth of GDP to close to thirty percent of GDP. Second, cross national differences in net expenditures are much smaller than differences in gross expenditures. Third, expenditures on in kind benefits constitute a big part of all welfare states—on average about half. Thus ignoring in-kind benefits distorts our understanding of what welfare states do and how they support families. Fourth, welfare states are highly redistributive in all countries. Fifth, as in previous research, we find that the US and more generally the English speaking countries are at or near bottom in equality and redistribution. Sixth, valuing in kind benefits at cost for all income groups substantially narrows differences in inequality within and

across countries. And seventh, how non-cash benefits, *especially health benefits*, are counted affects results: modestly in terms of differences for children and substantially for the elderly.

For the last 30 years the issue of valuing in-kind benefits, both conceptually and empirically, has been important and understudied (Smeeding 1982). The valuation problem has increased in recent years and includes education as well as health care. Conceptually it is clear that these benefits are worth some nontrivial amount to both rich and poor beneficiaries alike. They are also worthwhile for non-beneficiaries. Empirically, health and education subsidies are as large as, or larger than, the cash benefits which the welfare state provides for families in all nations. We need to realize the importance of these issues as we consider the relative effectiveness and generosity of all welfare states, most especially the United States.

Though it is premature to draw clear policy implications from our work to date, our analysis suggests that what distinguishes the US is not so much our overall level of spending, but rather how we spend the money—very low on cash benefits and very high on health care. When coupled with the sensitivity of our distribution of well-being results to the valuation of health care, two closely related, but not identical questions arise: Are we getting our money's worth from our extra-ordinarily high expenditures on health care? Could we derive the same benefits at much lower cost if we followed the example of every other advanced industrialized nation and adopted a universal national health insurance system? We are convinced by Cutler's (2004) work that the answer to the first question is yes. But claiming that benefits exceed costs says nothing about whether costs could be much lower with little or no diminution in benefits. Given the predominant role of prices in accounting for cross national differences in health care spending and the below average health outcomes of the US compared to other rich nations, we suspect the answer to the second question is also yes.

## Endnotes

1. Other perspectives—inter temporal or inter generational—may offer a different view. For instance, if there is a great deal of mobility over time or across generations within any nation, points in time views of the inter generational transfers will be biased (see for instance Lee, et al, 2005, on the intergenerational effects of education vs. health care and social retirement spending across several generations in the United States).
2. Our imputations do not include tax expenditures; they do include tax related refundable credits such as the Earned Income Tax Credit (EITC) in the United States and the Family Tax Benefit in the United Kingdom.
3. We assume that employer payroll taxes and employer provided health insurance in the United States are taken from wages that employers would otherwise pay. Thus, the “incidence” is on labor and to calculate income gross of benefits, we added these to market income. Direct taxes—personal income and employee payroll taxes—were allocated to the households and workers paid for them. Corporate taxes and value added taxes were assumed to be shifted to the consumer and were allocated according to total consumption (see text). Property taxes are assumed to fall on owners and renters and were distributed in proportion to housing consumption.
4. OECD data on early childhood education are by their own admission incomplete and inaccurate. Sources provided by Gornick and Meyers (2003) were more complete and consistent, except for subsidized child care for children under age three, where data is even less complete. Consequently, we omitted child care for children under age three.
5. Ordering of mixed cases was as follows Elders (persons 65 and older) with children are counted among families with children (age under 18); elders are only elders without kids. The remainder has neither elders nor kids and are the childless non aged.
6. Tax expenditures for housing are not counted.
7. The distribution of expenditures varies systematically with their provider. The distribution of tax expenditures and employers subsidized ‘social’ spending is much more pro-rich than the distribution of benefits provided directly by governments.
8. The public and employer subsidized figures that we use in our simulations understate how much more Americans spend on health as compared to citizens of other countries because private, out of pocket, health expenditures, which are quite substantial in the United States—another 2 percent of GDP—are not transfers and are therefore not counted.
9. In an earlier, but less complete article on this topic looking at many of these same nations in the early 1980’s. Coder, et al.(1993) found that inclusion of health care and education

subsidies valued at government cost lessened inequality among countries, but did not produce much if any change in country inequality ranking. This is still the case with the estimates presented here (see Appendix Table 3) though the decile ratios are much closer now because indirect taxes are counted here (and not in the 1993 article), but mainly because non cash benefit values for health and education have grown much faster than cash income over the past two decades.

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Table 1. Net Benefits as a Percent of Full Income by Quintiles<sup>1</sup>

**A. All Persons**

Country	Year	LOW	2	3	4	HIGH	TOTAL
Australia	1994	80.4	51.9	9.1	-10.1	-30.5	0.0
Canada	1997	51.2	36.6	9.4	-6.0	-22.7	0.0
United Kingdom	1999	70.6	51.0	19.7	-10.1	-28.6	0.0
United States	2000	33.6	24.5	10.9	-2.0	-16.1	0.0
Belgium	1997	68.3	49.2	13.1	-10.2	-29.1	0.0
France	1994	18.6	16.0	13.9	0.9	-16.3	0.0
Germany	2000	54.6	35.4	12.9	-7.3	-24.8	0.0
Netherlands	1999	42.5	27.8	3.5	-8.3	-17.5	0.0
Finland	2000	53.8	25.4	5.0	-5.3	-15.7	0.0
Sweden	2000	56.8	32.1	12.2	-2.9	-24.0	0.0
Average <sup>2</sup>		53.0	35.0	11.0	-6.1	-22.5	0.0

**B. Childed Households**

Australia	1994	71.9	30.8	7.1	-3.9	-25.0	3.5
Canada	1997	50.7	23.4	6.0	-4.6	-18.9	1.3
United Kingdom	1999	65.6	39.9	18.7	-3.4	-19.9	6.2
United States	2000	33.6	26.4	14.3	3.9	-11.3	5.2
Belgium	1997	44.9	9.4	-6.3	-18.8	-32.9	-10.5
France	1994	1.2	2.4	1.9	-8.5	-27.0	-10.2
Germany	2000	37.9	11.3	0.2	-6.9	-17.3	-1.9
Netherlands	1999	34.7	8.6	5.7	-0.5	-10.5	2.4
Finland	2000	47.1	22.5	9.5	-1.0	-8.7	6.7
Sweden	2000	34.3	11.7	2.7	-5.1	-20.2	-2.1
Average <sup>2</sup>		42.2	18.6	6.0	-4.9	-19.2	0.1

**C. Elder Households**

Australia	1994	92.6	93.6	88.1	63.5	6.7	52.0
Canada	1997	93.5	85.5	71.0	50.3	16.6	49.9
United Kingdom	1999	90.2	86.3	77.5	60.8	17.0	53.1
United States	2000	63.0	65.0	55.6	40.9	10.8	34.8
Belgium	1997	93.9	96.1	89.2	74.3	46.1	70.7
France	1994	93.0	87.7	84.9	81.6	70.9	80.1
Germany	2000	88.8	86.6	82.3	71.5	37.3	65.3
Netherlands	1999	90.2	83.2	66.7	44.3	20.6	50.7
Finland	2000	66.1	41.9	31.4	15.5	1.5	20.7
Sweden	2000	95.6	90.6	86.1	77.6	43.3	70.3
Average <sup>2</sup>		86.7	81.7	73.3	58.0	27.1	54.8

**D. Childless Households**

Australia	1994	70.6	13.6	-15.5	-24.8	-36.3	-17.4
Canada	1997	34.5	3.4	-13.6	-20.9	-31.3	-17.6
United Kingdom	1999	51.3	6.0	-22.9	-34.6	-37.2	-23.6
United States	2000	11.4	-8.0	-15.4	-19.7	-25.4	-18.2
Belgium	1997	54.5	12.7	-16.2	-30.9	-45.3	-22.5
France	1994	-24.8	-23.3	-21.2	-23.7	-36.8	-28.7
Germany	2000	44.7	0.1	-27.4	-39.5	-42.6	-28.2
Netherlands	1999	21.9	-5.0	-20.2	-31.2	-28.6	-20.7
Finland	2000	51.2	9.7	-12.2	-20.4	-24.3	-12.3
Sweden	2000	37.8	-8.9	-32.1	-42.4	-42.4	-29.6
Average <sup>2</sup>		35.3	0.0	-19.7	-28.8	-35.0	-21.9

Source: Authors' calculations from the Luxembourg Income Study.

Notes: <sup>1</sup>This table uses the difference between taxes paid and total benefits received as a percent of "final" or "full" income.

<sup>2</sup>Simple average.

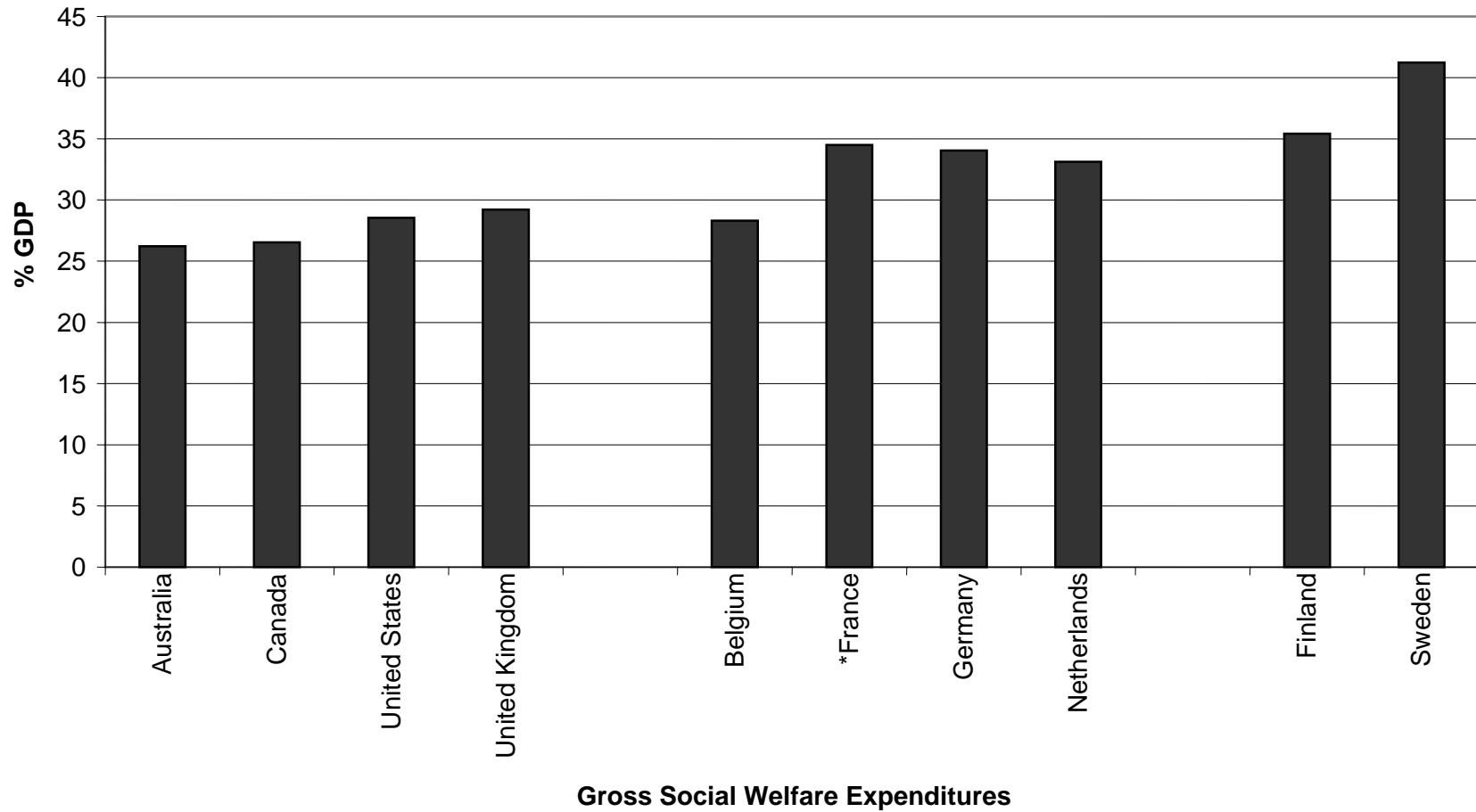
**Table 2. Summary of US in Comparative Perspective By Three Income Measures**

<b>A. CHILDREN</b>	<b>P10/P50</b>		<b>P90/P10</b>	
	<b>US</b>	<b>Average</b>	<b>US</b>	<b>Average</b>
Income Measure				
Disposable Cash Income	39	53	5.24	3.35
Full Income (Actual Benefit)	58	61	3.14	2.64
Full Income (Average Benefit)	52	69	3.66	2.71
<b>B. ELDERS</b>	<b>P10/P50</b>		<b>P90/P10</b>	
	<b>US</b>	<b>Average</b>	<b>US</b>	<b>Average</b>
Income Measure				
Disposable Cash Income	42	60	5.59	3.34
Full Income (Actual Benefit)	58	66	3.62	2.70
Full Income (Average Benefit)	43	60	5.77	3.28

Source: Figures 4-7.

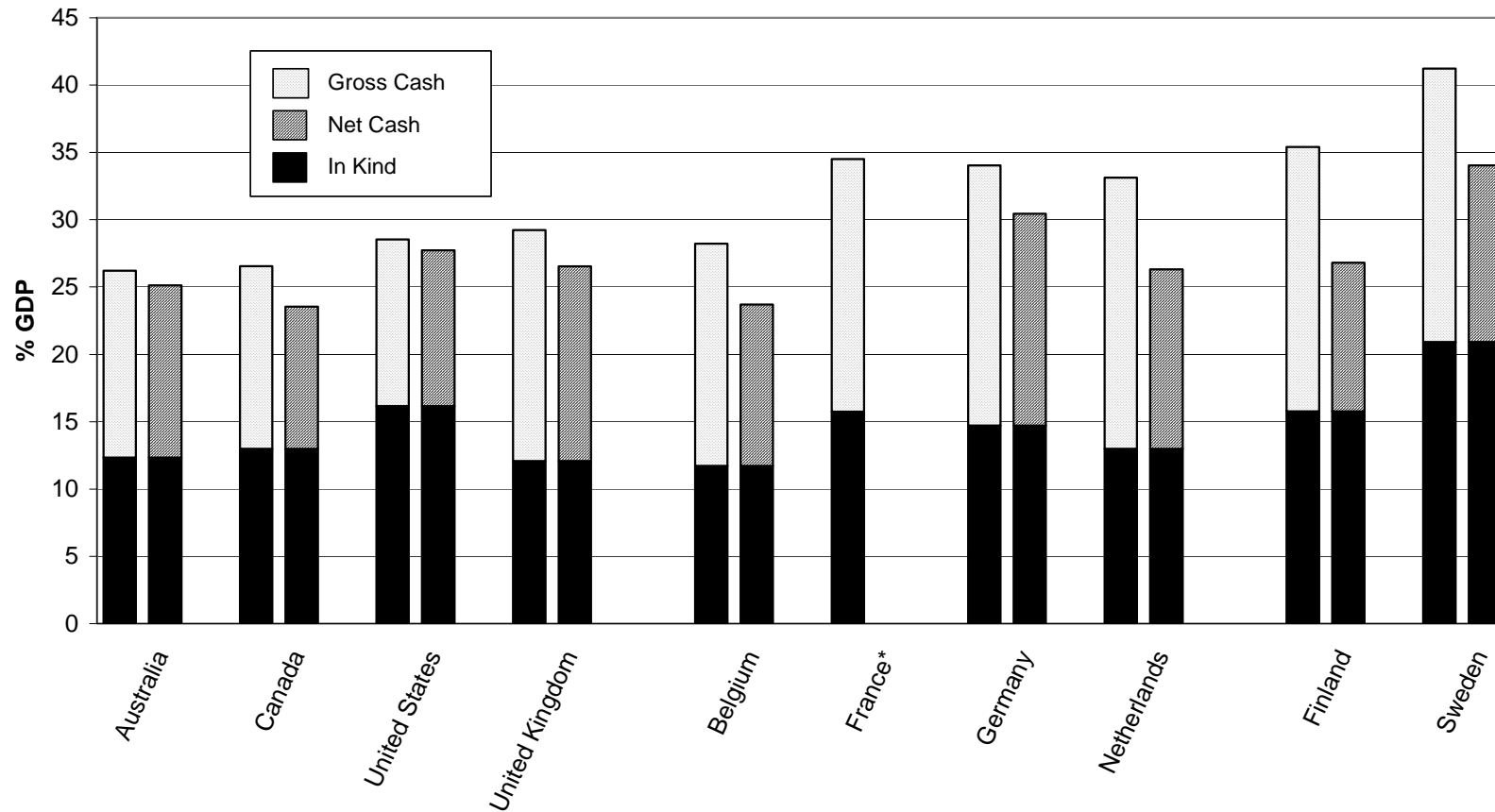
Note<sup>1</sup>: Average value of health and education benefits are the same for all countries!

**Figure 1. Gross Social Welfare Expenditures<sup>1</sup> in the U.S. and Other Welfare States  
FY 1997**



Note: <sup>1</sup>Definition: Gross Benefit figures include all welfare state spending on housing, health care, education, pension, family and work related benefits, and other cash and near cash benefits. Also includes employer-provided pensions and health care benefits. User charges are not included.

**Figure 2. Gross and Net Cash and In Kind Social Welfare Expenditures<sup>1</sup>  
in the U.S. and Other Welfare States  
FY 1997**

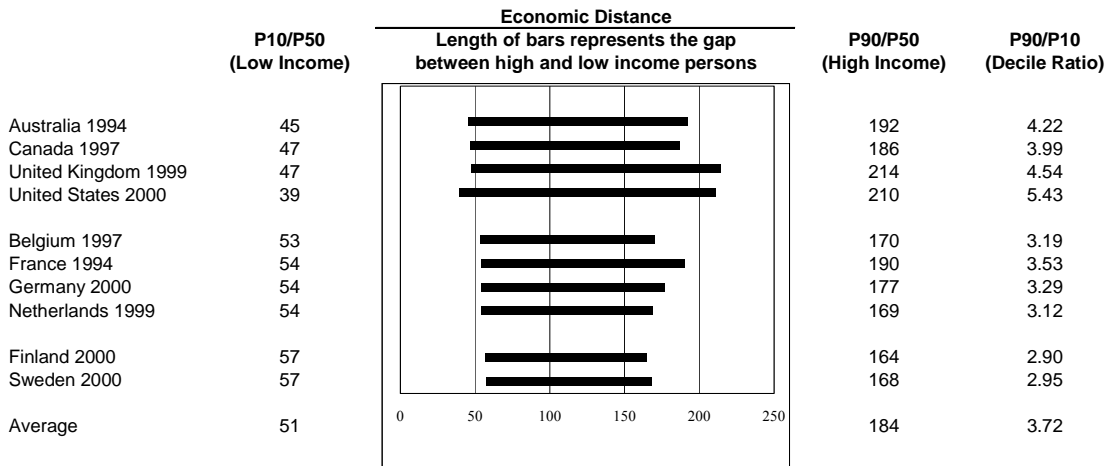


Note: 1Definitions: Gross cash figures include all welfare state spending on pensions for governments and employees, family and work related benefits and other cash and near cash benefits. Net cash figures for cash benefits include the net value of benefits after adjustments for the taxing back of cash benefits and for sales and value added taxes. In Kind figures include health care from governments and employers, education, some housing, and other social services in kind for which gross and net benefits are the same.

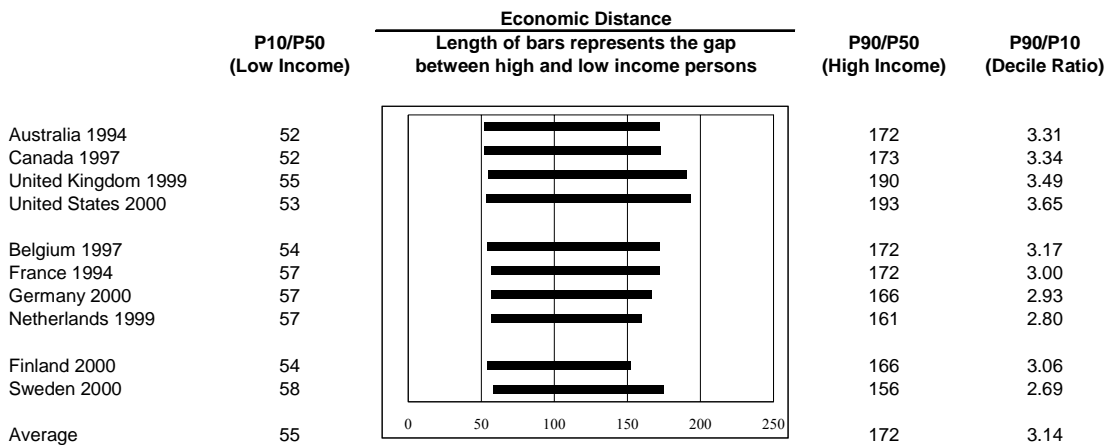
\*Net Cash figures are unavailable for France.

**Figure 3. Three Measures of Relative Economic Well-being: ALL PERSONS**  
 (numbers given are percent of all persons' median equivalent income in each nation in each panel)

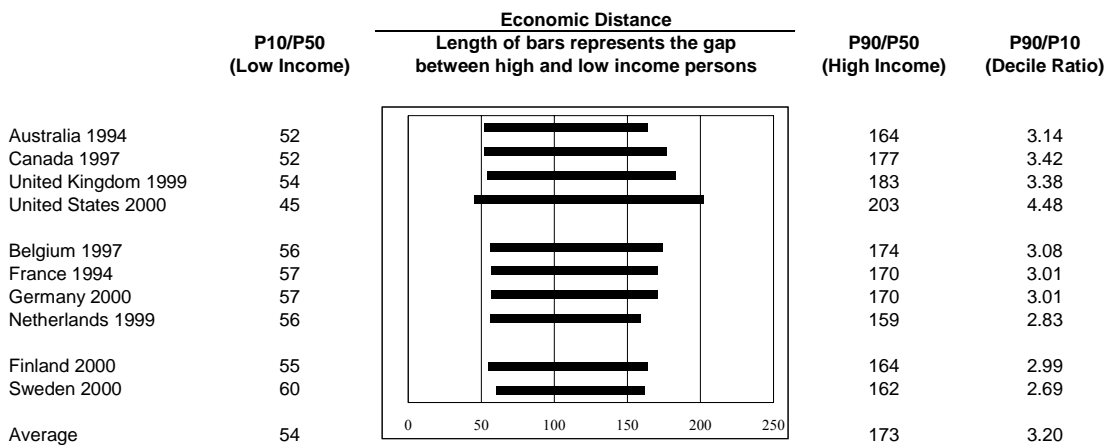
**A. Disposable Personal Income**



**B. Actual Full Income**



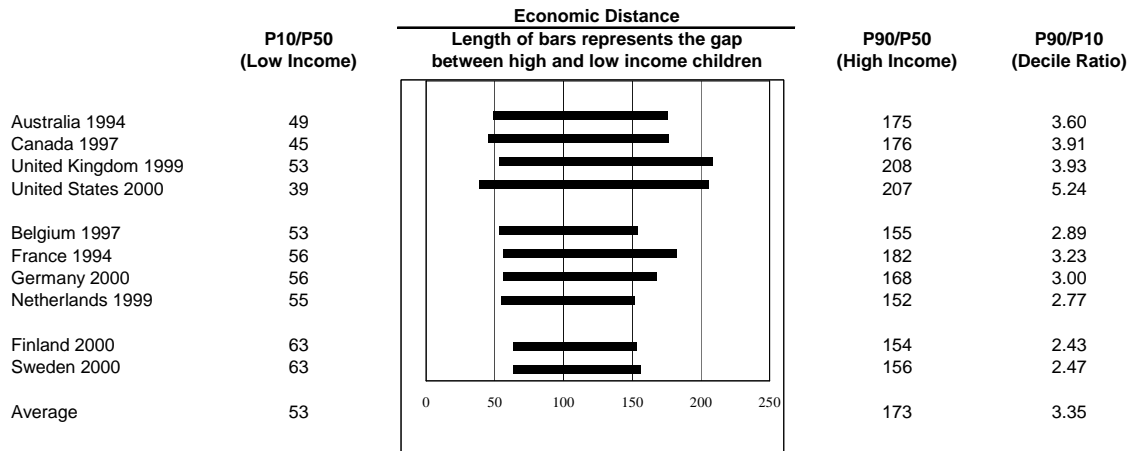
**C. Average Benefit Full Income**



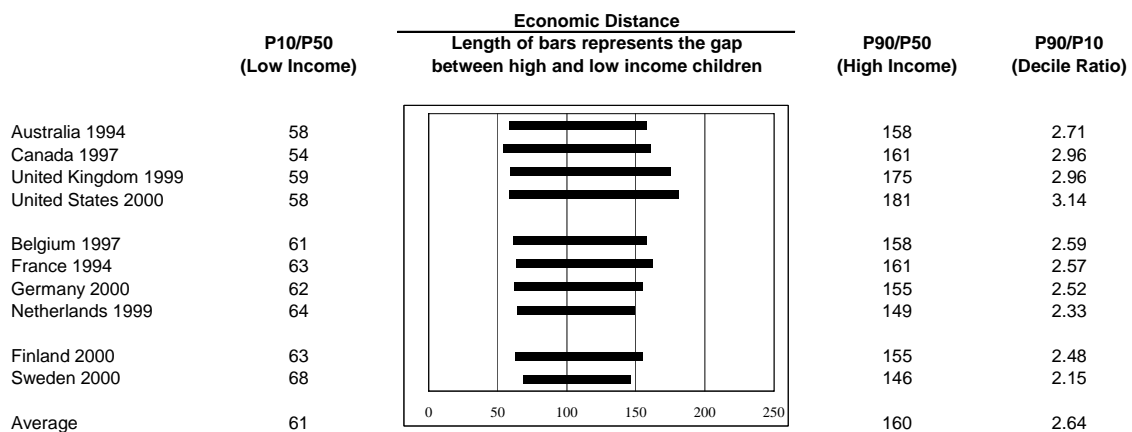
Source: Authors' calculations from the Luxembourg Income Study.

**Figure 4. Three Measures of Relative Economic Well-being: CHILDREN**  
 (numbers given are percent of children's median equivalent income in each nation in each panel)

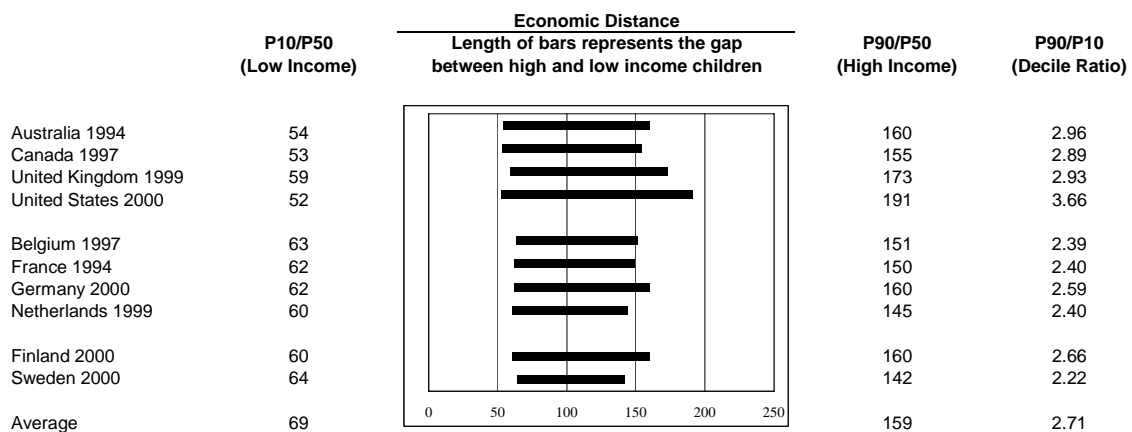
**A. Disposable Personal Income**



**B. Actual Full Income**



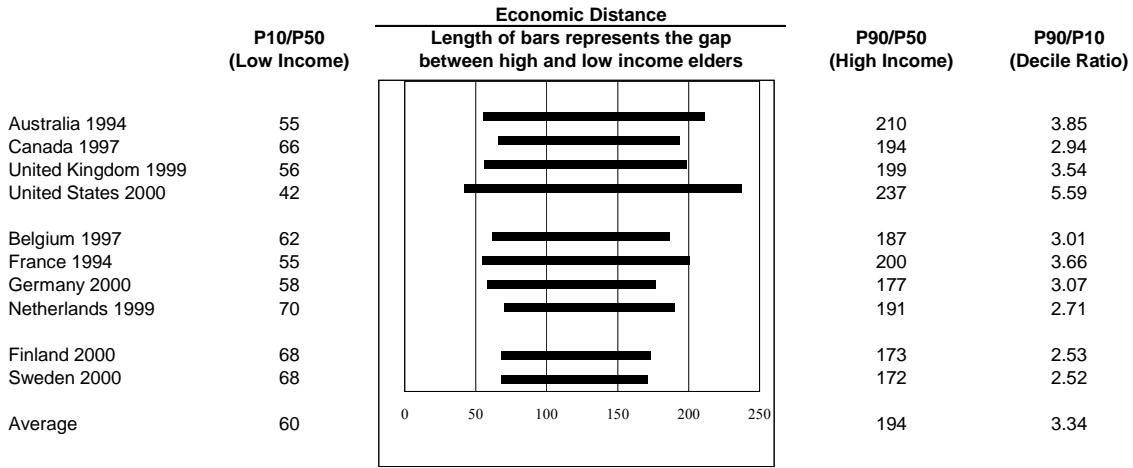
**C. Average Benefit Full Income**



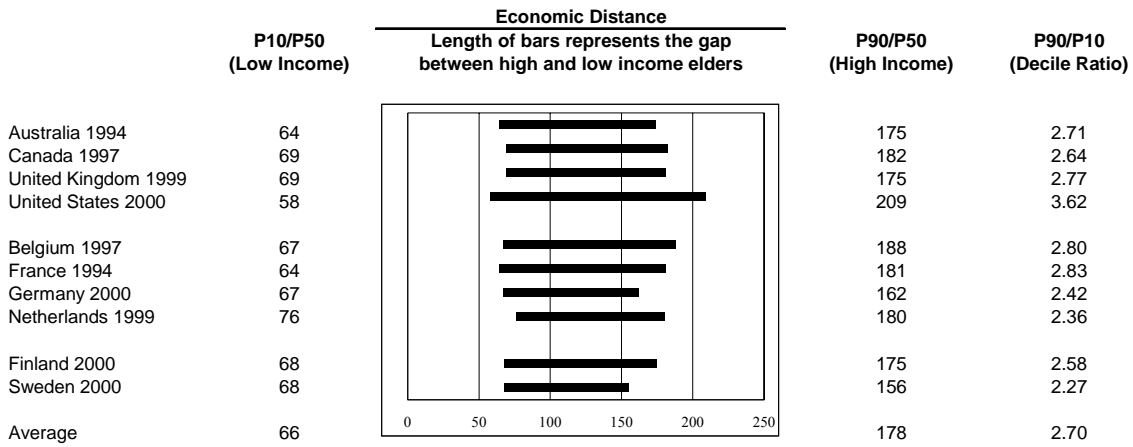
Source: Authors' calculations from the Luxembourg Income Study.

**Figure 5. Three Measures of Relative Economic Well-being: ELDERS**  
 (numbers given are percent of elder's median equivalent income in each nation in each panel)

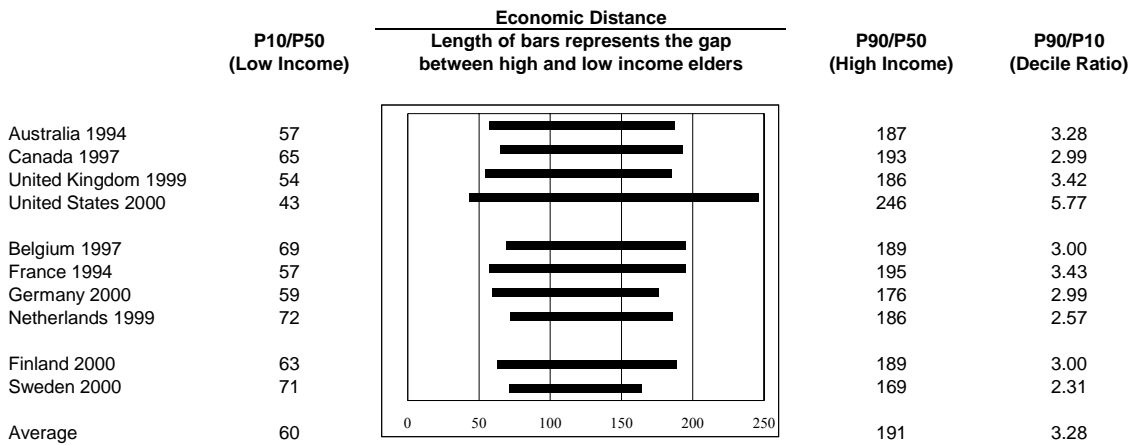
**A. Disposable Personal Income**



**B. Actual Full Income**



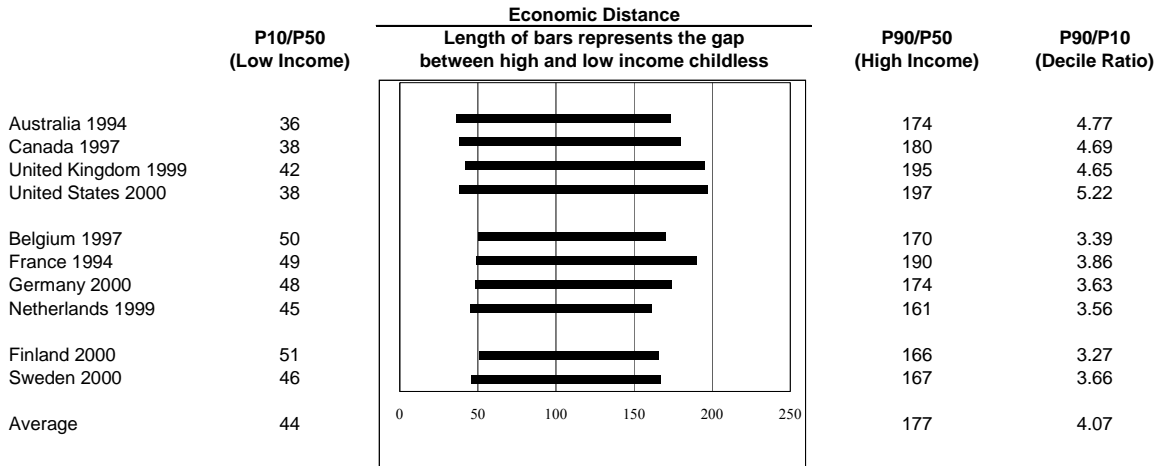
**C. Average Benefit Full Income**



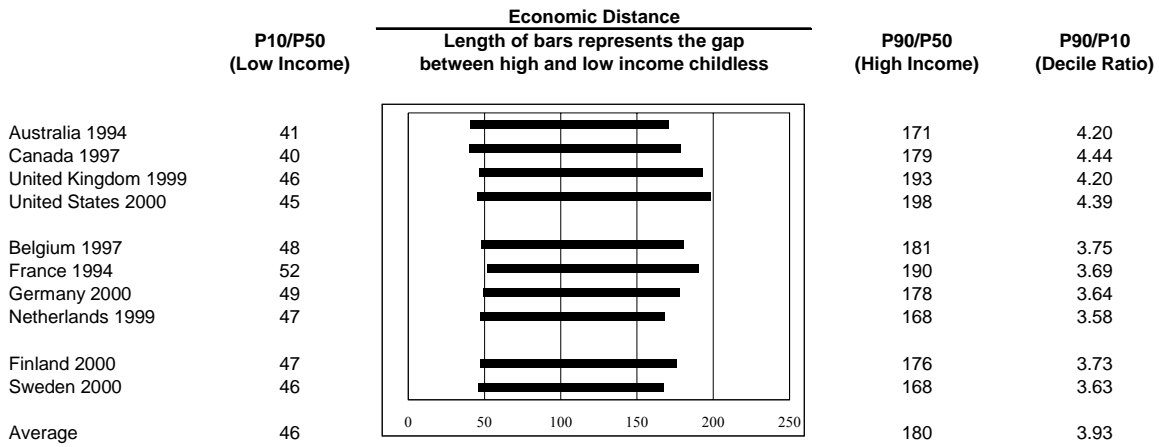
Source: Authors' calculations from the Luxembourg Income Study.

**Figure 6. Three Measures of Relative Economic Well-being: CHILDLess PERSONS**  
 (numbers given are percent of childless persons' median equivalent income in each nation in each panel)

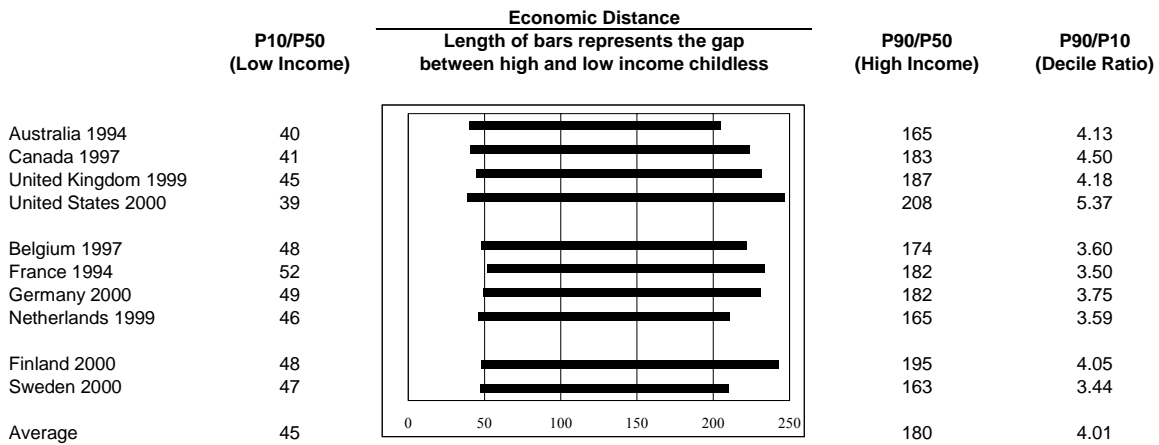
**A. Disposable Personal Income**



**B. Actual Full Income**



**C. Average Benefit Full Income**



Source: Authors' calculations from the Luxembourg Income Study.

## **Appendix: Technical Imputation Description**

We begin with Luxembourg Income Study net after direct tax and cash transfer disposable income for ten nations. To this cash and near cash data we add third party health care subsidies (public spending in all nations, and employer subsidies in the United States) and education subsidies (public sector support for early childhood education (ECE), elementary and secondary schooling, but not tertiary schooling or public daycare for children under age three). We then subtract direct and indirect taxes, including the LIS direct taxes (income and payroll taxes), and also VAT (sales, excise), corporate taxes, and real property taxes. We next rebalance total taxes to just equal total expenditures for the entire population. Thus, we exclude taxes paid for government final goods and services, and only subtract out taxes to the extent that they equal overall benefits paid in each country.

We use OECD (2003) purchasing power parities to put all non-cash benefits into 2000 United States PPP adjusted dollars, nationally price indexed to the correct nation year (1997 to 2000 for all but France and Australia, both 1994). When given OECD or other PPP adjusted benefits, we can then convert these to country currency, or vice versa. (For instance, we use both ECE data provided by Marcia Meyers (2003), which comes from Danish sources and is in national currency, and OECD data in United States dollars.) Given imputed benefits and taxes, we then analyze the relative effects of both on the entire population. Here we present only the highlights of our imputation schemes and analyses. Additional detail is available from the authors.

### **Health Care Benefit**

Health Insurance and third party expenditures on health care are the largest single element of non-cash benefit in every major country. We begin with OECD average public

subsidy per person taken from OECD (2002a). These subsidies are given in Appendix Table 1-A. The United States amount is not just public subsidy, but includes two additional amounts: employer subsidies, taken from the Employment Benefit Research Institute (2004), and an amount for the uninsured (about 15 percent of the United States population) who are receiving charity or other public care with a value of half of the amount provided by the public sector. Thus, for 2000, these per capita amounts are: \$2,005 (public subsidy); \$2,535 (employer subsidy); \$1,002 (uninsured subsidy). From the Current Population Survey (CPS) data which underlie LIS we can separate the United States population into those with public subsidy (Medicare, Medicaid, other); those with employer provided insurance; and the uninsured (from estimates provided by Barbara Wolfe 2002), and assign each person an average subsidy. In every other country we just assign public subsidies alone.

We then decided to impute the “insurance value” of coverage to each person based on their age. That is, we take each national average per capita amount, assign that to 19-34 year olds, and from there adjust the insurance subsidy according to a person’s age. The insurance value is the amount that an insured person would have to pay in each age category so that the third party provider (government, employer, other insurer) would just have enough revenue to cover all claims for such persons. The multipliers we used were .75 for persons under age 18; 1.0 for persons age 19-34; 1.25 for 35-54; 1.75 for 55-64; 3.0 for 65-74; and 4.0 for those 75 and over. These age related factors were taken from a paper by Smeeding and Freund (2002) who surveyed the literature on the topic. The same adjusters were used in all countries. We then readjusted the individual amounts so that the overall average imputed benefit just equaled the OECD overall average subsidy (and OECD, employer and uninsured overall subsidies in the United States) in each country. The resulting amounts are shown in column 1 of Appendix Table

1-A. The amounts ranged from \$1,063 in Australia (1994), to \$3,715 in the United States (2000). Germany, at \$2,086, is the closest nation to the United States. These were the “base case” or “full benefit” imputed amounts used in the simulation.

As a final technique, and to determine the affects of “equal” spending and thus the effect of “average” non-cash benefits alone in all nations, we assigned the overall average amount of \$1,719 (bottom row, Column (1), Appendix Table 1-A) to each and every person in each and every one of the ten countries. Again, we used the same age and overall benefit level adjustors to impute final amounts.

### **Education**

We used OECD (2002b) data to obtain average primary and secondary public expenditure per pupil in each country year (columns 2 and 3 of Appendix Table 1-A). These were assigned students according to starting and ending ages of primary and secondary school in each nation up to age 18. No account was taken of drop-outs or attending nonpublic schools. Each person received the same national average benefit according to OECD estimates. That was the easy part.

The hard part was determining the level and amount of spending for early childhood education (ECE) in each country. OECD (2002a) outlays were at odds with all other available data sources. Marcia Meyers (2003) was kind enough to share the data used in here recent book with Janet Gornick (Gornick and Meyers 2003) and to help us update these data. We used several sources including the Clearinghouse on International Developments in Child, Youth, and Family Policy at Columbia University (<http://www.childpolicyintl.org/>) and the European Union “Eurydice” website (<http://www.eurydice.org/>). These sources gave us five parameters: (1) number of children using ECE benefits in each nation; (2) number receiving full day vs. half day

benefits; (3) average amount spent per child per day; (4) average number of days attended; and (5) total spending in each country. We limited benefits to children aged three or over in the survey year; we randomly assigned children each benefit amount; and we integrated benefits in each nation with the year they began normal elementary schooling. Full details are available from authors.

These amounts are included in the overall average amount of benefit per child aged 3-18 in Appendix Table 1-A, columns 3 and 4, bottom row. We also considered a “PPP” type adjustment for education based on the average pupil-teacher ratio in each nation. However, the overall average and variance were so small that we ignored these differences. Thus, our “PPP-Quantity Adjusted” benefits for education are the same as those shown in Appendix Table 1-A, columns 3 and 4.

In our third and final simulation we assigned the overall average education benefit for elementary, secondary and ECE to each child in each nation. These amounts are, found at the bottom of columns 2 and 3 in Appendix Table 1-A.

## **Taxes**

We used OECD data on tax to GDP ratios and on the relative distribution of taxes by source for each nation, covering five taxes: personal income, payroll, corporate income, property, and “goods and services” (value added, sales, or excise) taxes. The LIS gives us the first two taxes directly (though the amount of employer payroll tax had to be imputed and then counted in the tax balancing equations). We assumed the incidence of the corporate tax, and goods and services tax, was on the consumer, and thus distributed according to overall consumption; the incidence of the property tax was assumed to fall on housing consumption. We assigned corporate and “goods and services” taxes (and property taxes) according to LIS

calculated ratios of overall expenditure (housing expenditure) to income ratios by LIS disposable income decile provided by Eva Sierminska and Thesia Garner from their LIS-based consumption work (Sierminska and Garner 2002). We then rebalanced all taxes to arrive at the average mix across taxes within nations, and to just equal total benefits paid in transfers or subsidies (cash and near-cash benefits, education, and health care) in each nation for the aggregate only. Hence, benefits just equal taxes in every nation. Again, greater detail is available from the authors upon request.

**Appendix Table 1-A. National Health and Education Benefits per Beneficiary for Each Country**

<b>Country</b>	<b>Year</b>	<b>Health Care<sup>1</sup></b> (OECD \$/person)	<b>Education<sup>2</sup></b>	
			<b>Elementary</b>	<b>Secondary</b>
Australia	1994	\$1,063	\$2,810	\$4,530
Belgium	1997	1,420	3633	5570
Canada	1997	1,532	5000	5900
Finland	2000	1,276	4136	6079
France	1994	1,398	3222	5761
Germany	2000	2,086	3929	6672
Netherlands	1999	1,461	4162	5670
Sweden	2000	1,866	5879	5973
United Kingdom	1999	1,371	3627	5608
United States	2000	3,175	6912	8537
Overall All Nation Average Benefit across All Types of Beneficiaries		\$1,719	\$4,331	\$6,030

Source: Authors' calculations from the Luxembourg Income Study.

Notes: <sup>1</sup>Includes OECD public subsidies, plus employer and other third party subsidies.

<sup>2</sup>Overall Education benefit per beneficiary by type of schooling. Ages of schooling vary by country. The average ECE per child was \$4001 for those enrolled full year, full time.

**Appendix Table 1-B. Mean Benefits per Household with Children for Three Education Levels<sup>1</sup>**

<b>Country</b>	<b>Year</b>	<b>Day Care</b>	<b>Elementary</b>	<b>Secondary</b>
Australia	1994	38	2,506	2,744
Canada	1997	389	4,154	3,776
United Kingdom	1999	470	3,118	3,943
United States	2000	303	5,302	5,800
Belgium	1997	767	2,902	3,897
France	1994	1,091	2,178	4,355
Germany	2000	498	1,753	5,658
Netherlands	1999	576	3,537	3,766
Finland	2000	902	4,297	1,833
Sweden	2000	773	6,351	1,650
<b>Average<sup>3</sup></b>		<b>581</b>	<b>3,610</b>	<b>3,742</b>

Source: Authors' calculations from the Luxembourg Income Study.

Note:<sup>1</sup>These are averaged over all households with children and are not the same as spending per beneficiary, which is shown in Appendix Table 1-A.