

# ***A discusión***

## **PUBLIC TRANSFERS TO THE POOR: IS EUROPE REALLY MORE GENEROUS THAN THE UNITED STATES?\***

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# **PUBLIC TRANSFERS TO THE POOR: IS EUROPE REALLY MORE GENEROUS THAN THE UNITED STATES?**

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## **ABSTRACT**

Fighting poverty is one of the main goals in most societies. This is usually done by transferring resources to the poor. There exists a widespread view that the European countries are more generous to the poor than the United States. We study whether this is really the case. First we review the evidence on aggregate spending and we do not find convincing support for that view. Secondly, we analyze microeconomic evidence from the Current Population Survey and the European Community Household Panel and find mixed results. In particular, when we use the concept of relative poverty, we find that average transfers per poor person in the United States are 54% higher than in the European Union. When we exclude the old from the sample, this difference reduces to 20%.

**JEL classification:** H51, H53, I38.

**Key words:** Poverty, Public Transfers, Redistribution, Welfare State.

# 1 Introduction

All societies agree that poverty is bad and that its elimination would be a good thing. In most countries the common view is that the government should lead the fight against poverty by raising the earning power of the people at the bottom of the income distribution. The most direct way of doing this is by just making transfers to this segment of the population. These transfers can be monetary transfers or in-kind transfers, like free public education or free access to health services. However, it seems that there is a large degree of heterogeneity across countries regarding the size of the transfers to the poor, even within the developed countries. In particular, it seems that there are large differences between the country members of the European Union and the United States.<sup>1</sup> The conventional wisdom is that transfers to the poor are much higher in Europe than in the United States.<sup>2</sup> The purpose of this paper is precisely to study whether this is really the case. To put it succinctly, we want to compare government generosity towards the poor in the United States with that in Europe.

The kind of evidence that many authors present to show that Europe is more generous to the poor than the United States consists of comparing total expenditure on social protection. In Section 2 we briefly review this evidence on aggregate spending. The main conclusion from Section 2 is that it is not possible to compare generosity towards the poor by just looking at aggregate data. Then, in the remainder of the paper we turn to analyze the microeconomic evidence. In particular, we use data from the European Community Household Panel (ECHP) for the European Union and from the Current Population Survey (CPS) for the United States, respectively. We use the standard definition of relative poverty to identify poor households in each country. We consider two definitions of public transfers. The first one only includes cash and near-cash transfers as food stamps. The second one also includes the monetary value of health transfers. We add health transfers because we believe that they can have a large impact in terms of removing individuals from poverty. Furthermore, excluding health transfers would mean to exclude a sizable fraction of

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<sup>1</sup>Throughout this paper when we talk about the European Union or simply Europe we always refer to the EU-15, that is: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

<sup>2</sup>See, for example, Alesina and Glaeser (2004) or Alesina, Glaeser, and Sacerdote (2001).

total expenditure on social protection.<sup>3</sup> Using the first definition we find that average cash transfers per poor person are slightly higher in the United States than in Europe (\$2,265 in the United States and \$1,927 in Europe). The differences become much bigger when we include the value of health transfers. The average transfer per poor person rises to \$5,484 in the United States compared to just \$3,562 in Europe. The reason for this is, as we will see below, that health transfers in the United States are more concentrated in the bottom part of the income distribution than in Europe. To confirm this evidence, we also analyze how public transfers are distributed across income quintiles. We see that, once we include health transfers, all quintiles get more transfers in the European Union than in the United States, except for the first and second quintiles. That is to say, even when the average value of public transfers is roughly similar in Europe and the United States, the distribution of transfers is much more progressive in the United States. The value of per capita transfers received by the bottom quintile in the United States is 26% higher than in the European Union.

The structure of the paper is as follows. In Section 2 we review the evidence on aggregate government spending. In Section 3 we describe the way we use micro data to construct poverty rates after transfers. We also describe how we calculate the imputed value of health transfers. In Section 4 we present the main results of the paper. In Section 5 we discuss several extensions of our approach. Finally, Section 6 presents our conclusions.

## 2 Preliminary Evidence: Aggregate Government Spending

We begin this section by showing data on expenditure in social protection collected by the OECD. Broadly speaking, by social protection we refer to four big programs: support for retired people, income support for working-age population, health-care, and other services such as child-care.<sup>4</sup> In the first column of Table 1 we present the data for 2001.<sup>5</sup> The share of GDP that goes to public social expenditure in the European Union ranges from 13.8 in Ireland to 29.8 in Sweden with a mean value of

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<sup>3</sup>In 2001 expenditure on health protection represented 25% of total expenditure on social protection in Europe, and 42% in the United States. See OECD (2006a).

<sup>4</sup>The OECD considers nine categories of Social Expenditure: Old age, survivors, incapacity, health, family, active labor market programs (ALMP), unemployment, housing, and “other.”

<sup>5</sup>See OECD (2006a).

Table 1. Macroeconomic Evidence

Country	Expenditure in Social Protection <sup>a</sup>	Net Public Social Expenditure <sup>b</sup>	Means- Tested Programs <sup>c</sup>	GDP per capita <sup>d</sup>	Per capita Social Expenditure <sup>e</sup>
Austria	26.0	20.6	1.63	29,144	7,362
Belgium	27.2	21.2	0.80	27,513	7,376
Denmark	29.2	21.8	0.92	29,631	8,537
Finland	24.8	19.2	3.06	26,754	6,535
France	28.5	25.2	3.41	26,923	7,558
Germany	27.4	25.4	2.59	25,815	6,975
Greece	24.3	–	2.14	17,278	4,141
Ireland	13.8	12.2	3.72	30,371	4,099
Italy	24.4	20.9	1.02	25,708	6,204
Luxembourg	20.8	–	0.65	50,032	10,245
The Netherlands	21.8	18.0	2.89	29,126	6,149
Portugal	21.1	–	1.59	18,097	3,780
Spain	19.6	16.7	2.44	21,657	4,179
Sweden	29.8	23.7	1.34	27,311	8,011
United Kingdom	21.8	19.8	4.09	26,968	5,906
European Union-15	23.8	21.8 <sup>f</sup>	2.7	25,692	6,471
United States	14.7	15.9	5.04	35,310	5,147

<sup>a</sup>Percentage of GDP in 2001. Source: OECD Social Expenditure Database ([www.oecd.org/els/social/expenditure](http://www.oecd.org/els/social/expenditure)).

<sup>b</sup>Percentage of GDP in 2001. Source: Adema and Ladaïque (2005).

<sup>c</sup>Percentage of GDP. For Europe, authors' calculations using 2001 data from Eurostat (2006). For the US, 2002 data. Source: Congressional Research Service (2004).

<sup>d</sup>2001 data. GDP per capita at current prices and current PPPs (US dollars). Source: OECD.

<sup>e</sup>2001 data. Data are per capita at current prices and current PPPs (US dollars). Source: OECD Social Expenditure Database ([www.oecd.org/els/social/expenditure](http://www.oecd.org/els/social/expenditure)).

<sup>f</sup>Average for the 12 countries covered by Adema and Ladaïque (2005).

23.8.<sup>6</sup> Since the corresponding figure in the United States is 14.7 we find that the average share in the European Union is 62% higher than in the United States. In the European Union only Ireland has a lower share than the United States. However, even though this evidence seems pretty clear, there are two caveats that we should consider.

Firstly, the above data reflect *gross* public social expenditure. In most countries cash transfers are taxable income, which means that the size of pre-tax transfers does not correctly reflect the impact that public transfers have on individual well-being. Differences among countries regarding the tax treatment of transfers distort the degree to which social expenditure translates into disposable income for families. For example, in the Netherlands almost all social benefits are taxable income, while in Germany taxation is rather limited. As far as we are aware, the only study that attempts to calculate *net* public social expenditure is Adema and Ladaique (2005). They define net public social expenditure as gross public social expenditure less taxes paid out of public cash transfers, plus tax breaks for social purposes. They calculate *net* public social expenditure as a fraction of the GDP for 23 OECD countries, in 2001. These 23 countries include the United States and all countries in the European Union except Greece, Luxembourg, and Portugal. We present these data in Table 1, Column 2. In all European countries, governments collect more money through taxation than they return in tax breaks, which implies that *net* public social expenditure is always smaller than *gross* public social expenditure. The largest differences can be seen in Denmark, Sweden, Finland, and Austria. For example, while net social expenditure in Denmark represents 21.8% of GDP, the gross figure is 29.2%. On average, Danish families finally enjoy only around 3/4 of gross transfers. The average value of the share of net transfers for the 12 European countries in the sample is 21.8%, while the gross figure is 23.8%. This means a reduction of 9%. The United States represents the only exception to this general pattern, since net social expenditure is higher than gross social expenditure: 15.9% of GDP versus 14.7%, an 8% *increase*. One of the reasons for this increase is the existence of programs like the Earned Income Tax Credit (EITC). In the United States gross public expenditure underestimates public social effort. If we consider net instead of gross transfers, the gap between the

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<sup>6</sup>This and all the remaining figures for the European Union in the paper are always weighted sums of individual country data, where the weights correspond to the relative population of each country.

United States and the European Union narrows considerably. From 62% with gross expenditure, it becomes 37% with net expenditure.<sup>7</sup>

The second thing to notice is that, if country A spends more on social protection than country B does, this does not mean that the poor are treated better in country A. We need to study how public expenditure is distributed across different income groups. Suppose, for example, that in country A most transfers go to the middle class while in country B most transfers go to the poor. It might actually be the case that it is country B that treats the poor better. In the European countries most public programs are not directly targeted towards the poor. For instance, although most public pension systems produce some redistribution, pension benefits are strongly linked to past contributions, meaning that replacement rates are roughly constant in many countries, at least up to a certain level of previous contributions.<sup>8</sup> One possible approach would be to consider only transfers that are intended to remove people from poverty. However, it is difficult to compare Europe with the United States using this approach, because in Europe those kinds of transfers represent a small fraction of total transfers. In the United States, on the contrary, there are many public programs that are demographically targeted to groups where the poor are disproportionately represented, like the elderly or the disabled. These programs are labelled as “welfare” programs. In fact, in the United States the word “welfare” is used as synonymous of “public assistance,” and typically refers to programs that provide basic support to low-income families. These programs are means-tested, which means that eligibility is determined solely or partially on the basis of low income.<sup>9</sup> Other entitlement programs like Social Security or unemployment insurance are not considered “welfare” programs. Thus, for the United States we could, in principle, distinguish between transfers that focus mainly on the poor and transfers that are universalistic.<sup>10</sup> In 2002

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<sup>7</sup>The gap would be even smaller if we included in the picture the three European countries not contemplated by in Adema and Ladaique (2005).

<sup>8</sup>See Whitehouse (2003) for data on replacement rates of public pension systems in several OECD countries.

<sup>9</sup>There are more than 80 governmental programs in the United States providing cash and non-cash aid, primarily to persons with limited income. These programs include TANF (Temporary Assistance to Needy Families), Medicaid, SSI (Supplemental Security Income), Food Stamps, EITC (Earned Income Tax Credit), and Pell Grants. See Moffit (2003) for a detailed description of the main means-tested programs in the United States.

<sup>10</sup>This is not completely correct, since Social Security benefits are calculated according to a formula that benefits lower-income workers. This means that at least some part of the Social Security payments could also be seen as “welfare” payments.

the United States spent slightly more than 5% of GDP on income-tested programs.<sup>11</sup>

In Europe things are different. Most welfare programs are universalistic, so that entitlements are available to everyone regardless of income. Consequently, virtually all Europeans have universal health care, or universal access to free pre-school. In fact, only a small fraction of public transfers is means-tested. In Column 3 of Table 1, we present evidence on the proportion of GDP that represents social expenditure in means-tested programs. All European countries spend a lower fraction of GDP than the United States. The fraction goes from 0.65% in Luxembourg to 4.09% in the United Kingdom. The average value for the European Union is 2.7%. To put it in another way, 90% of social expenditure in the European Union is not means-tested. The lion's share of social expenditure is not directly targeted to the poor, although this does not mean either that the poor are not the main recipients of social expenditure.

Now consider the following back-of-the-envelope calculation. We divide the population into five quintiles, according to income, and assume that all non means-tested social expenditure is divided evenly among the five quintiles.<sup>12</sup> Regarding means-tested social expenditure, let us assume that everything goes to the first quintile (the bottom quintile). According to this, the European poor defined as the bottom 20% of the population get  $2.7\% + 4.2\%$  (one fifth of non means-tested expenditure) = 6.9% of GDP, while in the United States they get  $5.0\% + 1.9\% = 6.9\%$ . In this calculation we have used gross expenditure. Using net expenditure the numbers are  $2.7\% + 3.8\% = 6.5\%$  in Europe and  $5.0\% + 2.2\% = 7.2\%$  in the United States. Although these are very rough measures of how much transfer the poor get, they illustrate how misleading aggregate figures can be. To get better information we need to use microeconomic data.

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<sup>11</sup>The total figure was \$522.2 billion, \$373.2 billion in Federal funds and \$149 billion in State and local funds. The largest programs were Medicaid (\$258 billion), Supplemental Security Income (\$38 billion), Earned Income Tax Credit (\$28 billion), Food Stamps (\$24 billion), Low-Income Housing Assistance (\$18.5 billion), Temporary Assistance for Needy Families (\$13 billion), and Federal Pell Grants (\$11 billion). See Congressional Research Service (2004).

<sup>12</sup>This seems to be a very strong assumption. However, in Section 4 we will see that maybe it is not that strong.



### 3 Micro Data and Methodology

To calculate the value of public transfers to the poor in Europe and in the United States we proceed in several stages: First, we have to specify the definition of income that we are going to use. Second, we need to define a poverty line for each country so as to divide the population into two groups: the poor and the non-poor. Third, we have to define which transfers we are going to consider. We discuss each of these aspects in turn.

Our definition of income corresponds to disposable cash income, that is, market income minus taxes plus cash and near-cash transfers, like food stamps and housing allowances.<sup>13</sup> This is the most widely used definition in studies of poverty since it is the one that corresponds best to disposable income in the household. To compute household income we use micro-data from the European Community Household Panel (ECHP) and the Current Population Survey (CPS). The ECHP is a standardized multi-purpose annual longitudinal survey carried out at the level of the European Union. It is centrally designed and coordinated by the Statistical Office of the European Communities (Eurostat), and covers demographics, labor force behavior, income, health, education and training, housing, migration, etc. The ECHP started in 1994. Here we will use the last wave, 2001, where all income data correspond to the year 2000.

The CPS is a monthly survey of about 50,000 households carried out in the United States by the Bureau of the Census for the Bureau of Labor Statistics. It has been conducted for more than 50 years. It is the primary source of information on the labor force characteristics of the United States population. Estimates obtained from the CPS include employment, unemployment, earnings, hours of work, and other indicators. In particular the March CPS surveys provide detailed information on household income and we use the March 2001 wave in this study.

Our definition of disposable income relies heavily on the information that we can obtain from the ECHP. Comparing the ECHP with the CPS, we see that the former has less detailed information regarding the different sources of income. What we do is to extract the best information we can get from the ECHP, and then we use the CPS

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<sup>13</sup>Market income in the United States includes employer contributions for health insurance. As Garfinkel, Rainwater and Smeeding (2006) point out, the inclusion of employer-provided health insurance increases income inequality, since the very poor receive very little of it.

to match the definition of income that we construct with the ECHP. See Appendix 1 for details.

We use the household as the unit for income aggregation, and the person as the unit of analysis. We use equivalence scales to make comparisons between households of different size. Equivalence scales are used to adjust household income for differences in needs regarding household composition. The equivalence scale that we use is the square root of household size. According to this scale the poverty line for a household of 4 persons is twice as high as the poverty line for a household with only one person. Individual income is then estimated by pooling the income of all persons in the household and using the equivalence scale to get the equivalent income of each individual person. We are assuming, therefore, that income within the household is shared equally among its members.

Finally, to make all monetary variables comparable across countries, we use PPPs to convert all variables into US dollars.<sup>14</sup> This means that all data on income and transfers corresponding to different countries have been adjusted so that they correspond to the same purchasing power.

Our second task consists in defining who is poor and who is not. When we look into the literature on poverty, neither among philosophers nor among scientists do we find agreement on a definition of who is poor. We try to avoid these methodological problems by using two different approaches. In the first approach we use relative poverty, where the poverty line for each country is defined as a fraction of median income. The poor are all individuals living in households with income below the poverty line. As is standard in many cross-national studies on poverty we will fix the poverty line at 50% of national median adjusted income.<sup>15</sup> Using relative poverty, the poverty line represents a higher purchasing power in richer countries. The reason for using a relative measure of poverty, or relative deprivation, is that sometimes individuals think of themselves as poor when they compare themselves with their neighbors. They care not only about their absolute income, but also about relative income.

Once we set a poverty line for a country, its population is split into two groups:

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<sup>14</sup>We use the PPP data available in the ECHP.

<sup>15</sup>There are many other possibilities. For example, Eurostat recommends setting the threshold at 60 percent of median income, while in the United States the poverty line is close to 40 percent of median household income. See Smeeding, Rainwater, and Burtless (2002).

the poor and the non-poor. The poor are those below the poverty line and the non-poor those above. This allows us to compare the size of the transfers between the two groups, as well as to compare transfers to the poor across countries.

Due to the shortcomings that the definition of relative poverty has, we also explore a second approach. Instead of dividing the population into just two groups, we study the size of public transfers received by households at different percentiles of the income distribution. In particular, we divide the population into five quintiles. By analyzing the value of transfers received by quintiles, we have an alternative perspective of the problem. In fact, we could simply assume that households in the bottom quintile, namely the 20% households with less income in the population, are the poor.<sup>16</sup> This approach is interesting because it allows us to study how public transfers are allocated among the different levels of income in the society. This tells us about the degree of progressivity of transfers.

### 3.1 Public Transfers in Cash

We consider cash transfers from the government. In particular public cash transfers include pension payments, unemployment benefits, welfare transfers, public grants for education, etc. All of them are net of taxes, because all income data in the ECHP are net of taxes.<sup>17</sup> There are some problems with the treatment of pensions. In particular the ECHP does not make a distinction between pension benefits that come from public sources and pensions from private plans. Although in most European countries the fraction of income that old people get from private pensions is rather small, there are some exceptions, such as in the Netherlands and the United Kingdom.<sup>18</sup> This means that public pension payments, and as a consequence cash transfers, are slightly overstated in the European countries.

### 3.2 In-kind Health Transfers

If we take into account only cash transfers, we would be excluding a sizable fraction of what is considered as public expenditure on social protection. Roughly speaking, six out of the nine categories of the OECD classification correspond to cash trans-

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<sup>16</sup>Feldstein (1998) suggested this as a possible definition of poverty.

<sup>17</sup>We give detailed information on the construction of these variables in Appendix 1.

<sup>18</sup>In the Netherlands, 37% of total income for couples aged 60 or more comes from private pensions. In the UK this figure is 26.5%. See Disney and Johnson (2001).

fers.<sup>19</sup> These six categories comprise 69% of total expenditure on social protection in the European Union, and 57% in the United States, in 2001. By including health transfers, we are considering up to 95% of total expenditure on social protection in the European Union and 99% in the United States, as reported by the OECD.

Although in-kind transfers like health transfers are generally less effective than cash transfers in increasing the welfare of the household, we think that not including them would produce a distorted picture of the comparison between Europe and the United States. The situation in Europe can be described as universal coverage, with unlimited benefits including payments for doctors' fees, hospitalization expenses, and drugs. Some countries finance health care basically out of taxation, while others rely on compulsory social insurance, or on a combination of both. The existence of health insurance at the national level implies that families do not need to set some money aside to pay for private health insurance and, thus, they can spend that money in other goods or services. In the United States the situation is quite different since most people have employment-based health insurance. In 2003 this was the case for 243.3 million people, 60.4% of the population. Another 76.8 million people (26.6% of the total population) were covered by government health insurance programs. Of these, 39.5 million (13.7%) were covered by Medicare, 35.6 million (12.4%) by Medicaid and 10 million (3.5%) by military health care.<sup>20</sup> Medicare is a national health insurance program that is basically designed for old people and for individuals with disabilities. Medicaid is a means-tested transfer program that funds medical assistance to low-income people with certain specific characteristics: the aged, the blind, the disabled, pregnant women, and children.<sup>21</sup> In the year of reference, 2000, total public health expenditure in the United States was 592.4 billion dollars, 5.9% of GDP, of which 216.9 billion went on Medicare (36.6% of total expenditure) and 188.3 billion on Medicaid (31.8%). Finally, an estimated 15.6% of the population, representing 45 million people, had no health insurance in 2003.

The calculation of the monetary value of health transfers is as follows. The first

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<sup>19</sup>These six OECD categories are: old age, survivors, incapacity, family, unemployment, and "other."

<sup>20</sup>Some individuals are covered by both Medicare and Medicaid. For data on Medicare and Medicaid, see the web page of the Centers for Medicare and Medicaid Services at: <http://www.cms.hhs.gov>

<sup>21</sup>However, according to Feldstein (2005), more than half of Medicaid outlays are for nursing home care for the very elderly rather than care for low income people.

source of information for the European Union consists of OECD data on per capita public health expenditure.<sup>22</sup> However, it is widely known that expenditure on health is not homogeneous across age groups, rather it is typically skewed towards the old. To account for this fact we use as a second source of information age profiles of health-care expenditure constructed by the OECD.<sup>23</sup> These age profiles divide the population of each country into 20 age groups, going from individuals younger than 5 up to individuals 95 and older. The information provided by these profiles consists of per capita public health care expenditure for each age group as a percentage of GDP per capita. In Appendix 2 we summarize briefly how we combine both sources of information to calculate the monetary value of per capita health transfers.

For the United States we believe that the above procedure is not appropriate because health insurance is not universal. Moreover, in the CPS there is information on the so-called “Market value of Medicare” and “Market value of Medicaid.” The market value of Medicare and Medicaid, also called insurance value, equals the average cost to the government of providing medical services to persons within a specific risk class. As an example, the risk classes are the elderly and the disabled for Medicare. The problem with this approach is that if we just do this, we will be understating the value of health transfers in the United States. The average value of the sum of the market value of Medicare and Medicaid in the CPS is just \$945.7, while the value of per capita public health transfers in the United States computed by the OECD is \$2,015.<sup>24</sup> What we do is to assign the per capita difference (\$1,069.3) using the age profile for the United States constructed by the OECD in the same way we did with the European Union.<sup>25</sup> The fact that the market value of Medicare and Medicaid seems to be underreported in the CPS is closely related with the observation that health insurance coverage in the CPS is also underreported, as has been already

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<sup>22</sup>See OECD (2006a).

<sup>23</sup>The primary data to construct these profiles comes from the AGIR data set (Pellikaan and Westerhout (2005), based on EPC (2001)), and final profiles were constructed by Oliveira, de la Maisonneuve, and Bjørnerud (2006). We thank Joaquim Oliveira Martins (OECD) for sending us the profiles.

<sup>24</sup>In the CPS average market values per recipient of Medicare and Medicaid are \$4,951 and \$2,562, respectively. However, the calculations made by the CMS about average benefits per enrollee are \$5,400 and \$4,400, respectively. This means that one reason for the large discrepancy above could be that Medicaid transfers are largely understated in the sample.

<sup>25</sup>It would be desirable to use health-specific PPPs to compare the monetary value of health transfers among countries. Although there is an ongoing joint project between the OECD and Eurostat to build health-specific PPPs, they are not available yet.

noticed by DeNavas-Walt, Proctor, and Mills (2004). They find that the CPS under-reports Medicare and Medicaid coverage when compared with enrollment data from the Centers for Medicare and Medicaid Services (CMS).

We close this section by commenting briefly on the quality of measured transfers in the two surveys by comparing them with the aggregate data collected by the OECD. When we include health transfers, the average value of transfers in the household surveys are \$4,225 in Europe and \$4,120 in the United States. In the last column of Table 1 we see that the average value of per capita social expenditure calculated by the OECD is \$6,471 for Europe and \$5,147. However, while the values we obtained from the surveys are in net terms, per capita social expenditure is in gross terms. To make both numbers comparable we do the following. Dividing the value in the third column by the number in the second column in Table 1 we get numbers that allow us to turn the gross values of the last column into net values. These numbers are 0.916 for Europe and 1.082 for the United States. Then, we get that per capita expenditure in net terms is \$5,927 in Europe and \$5,567 in the United States. Finally, we see that the proportion of transfers captured by the two surveys is roughly similar. In the case of Europe we capture a 71% ( $4,225/5,927$ ) while in the United States we capture a 74% ( $4,120/5,567$ ).

## 4 Main Results

We start by computing relative poverty rates for all countries in the European Union and for the United States in 2000. We present these results in Table 2. We also compute an index of poverty for the European Union as a whole. This index is a weighted average of the 15 country members, where the weights correspond to the relative population of each country. In Column 2 we present the poverty line for each country and in Column 3 we present the poverty rates.<sup>26</sup> The poverty rate in the European Union is 8.8%, compared to 17% in the United States. The fact that the rate of relative poverty is higher in the United States has been extensively documented in the literature on cross-country comparisons of poverty rates.<sup>27</sup> All European countries have a lower rate of relative poverty than the United States. It

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<sup>26</sup>The poverty line is measured in euros for the European Union and in U.S. dollars for the United States.

<sup>27</sup>See, for example, the recent work by Smeeding (2006).

Table 2: Relative Poverty

	Poverty line    Poverty rate		Transfers do not include health services			Transfers include health services		
			Mean transfers to the poor	Mean transfers to the non-poor	% of transfers received by the poor	Mean transfers to the poor	Mean transfers to the non-poor	% of transfers received by the poor
Austria	8667	7.1	2798	3603	5.6	5201	5426	6.9
Belgium	8425	5.1	3725	2977	6.3	6172	4664	6.7
Denmark	10468	5.6	3233	2721	6.6	5656	4655	6.7
Finland	8060	5.9	1993	2195	5.4	3167	3491	5.4
France	7988	7.5	2319	3127	5.6	4401	4966	6.7
Germany	8849	5.8	2768	3092	5.2	4793	5194	5.3
Greece	3544	11.5	1195	1668	8.5	2337	2480	10.9
Ireland	7444	11.2	2981	1617	18.8	4797	2882	17.3
Italy	5454	12.3	1078	2327	6.1	2516	3836	8.4
Luxemb	13189	6.3	2785	5116	3.5	5022	7807	4.1
Netherl	7514	6.2	1402	2762	3.2	2551	4204	3.9
Portugal	3104	12.4	1279	1669	9.8	2736	2806	12.2
Spain	4753	11.1	1421	2055	7.9	2585	3134	9.3
Sweden	8797	4.9	2113	3003	3.5	3764	4946	3.8
UK	9055	11.0	2287	2340	10.8	3901	3830	11.2
EU-15	–	8.8	1927	2648	6.6	3562	4289	7.4
USA	12126	17.0	2265	2072	18.3	5484	3840	22.6

is remarkable how countries in the European Union are split into two groups: in the first group of countries (Greece, Italy, Spain, Portugal, Ireland, and the UK) the poverty rate is above 10%. In all other countries (Sweden, France, Belgium, Austria, the Netherlands, Luxembourg, Denmark, Germany, and Finland) the poverty rate is always below 8%.

In Columns 4 and 5 we represent the value of mean cash transfers to the poor and to the non-poor, respectively, where the poor (non-poor) are those below (above) the poverty line. All values in Columns 4 and 5 are in PPP adjusted US dollars, so that we can make comparisons among countries. In the European Union cash transfers to the poor range from \$1,078 in Italy to \$3,725 in Belgium, with an average value of \$1,927. Cash transfers to the poor in the United States are \$2,265, slightly above the average in the European Union. Seven countries in the European Union give fewer transfers to the poor than the United States and eight countries give more. Looking at the size of transfers to those above the poverty line, we find that in all European countries but Belgium, Denmark, and Ireland they get higher cash transfers than those below the poverty line. This trend is confirmed by the fact that in the European Union every individual above the poverty line receives, on average, a transfer that is 37% higher than the average transfer received by each poor individual. On the contrary, in the United States the poor get an average transfer that is 9% higher than the non-poor. In Column 6 we show the fraction of total transfers that goes to the poor in each country. If the number in Column 6 exceeds the corresponding number in Column 3, this means that the poor as a whole get more transfers than their fair share. In Austria, for example, the poverty rate is 7.1%. If total transfers were divided equally among all Austrian citizens, the poor would get 7.1% of total transfers. However, in Column 6 we see that they only get 5.6% of total transfers.

In Columns 7-9 we add the monetary value of health transfers. Things change dramatically after including the value of health transfers. In Europe the average transfer to the poor rises to \$3,562, while in the United States it rises to \$5,484, 54% higher than in Europe. Among the fifteen members of the European Union, only Belgium and Denmark give higher transfers to the poor than the United States. The reason for this change, compared to Columns 4 and 5, is that in the United States health transfers are more progressive than in Europe, basically because of the existence of Medicare and Medicaid. Regarding transfers to the non-poor, it is just



the opposite. In Europe they are on average \$4,289, while in the United States they amount to \$3,840.

In Column 9 we again present information regarding the fraction of total transfers, including health transfers, that goes to the poor. The information we get is similar to that we obtained in Column 6. Only in four European countries does the number in Column 9 exceed that of Column 3, the poverty rate. These countries are Belgium, Denmark, Ireland, and the UK. In the United States the poor constitute 17% of the population, and they get 22.6% of total transfers.

In Tables 3 and 4 we see the relationship between the level of transfers and the income of the recipient. To build Tables 3 and 4 we do the following. We classify all individuals in the sample according to income and divide the population of each country into five income groups or quintiles. Thus, the first quintile comprises all the individuals in the bottom 20% of the distribution. Following Feldstein (1998), we can consider the first quintile to represent poor individuals. Then, we calculate average transfers received by each of the five quintiles. We repeat the exercise twice. In Table 3 we consider only monetary transfers, whereas in Table 4 we also include health transfers. In the first column of Table 3 we write average cash transfers across all individuals in the sample. Average transfers are \$2,105 in the United States and \$2,584 in the European Union, i.e. 23% higher. In Columns 2-6 we calculate average transfers for the five quintiles. In Columns 7-11 we calculate the share of each quintile over the total value of cash transfers. It is very surprising to see that in most countries the pattern is quite odd. In nine European countries and also in the United States the share of the top quintile is higher than the share of the bottom quintile. When we compare the European Union as a whole with the United States we find a similar pattern on both sides of the Atlantic. We could say that cash transfers are roughly constant across quintiles.

In Table 4 we add the imputed value of health transfers. In Column 2 we see that now average transfers are roughly the same in the European Union (\$4,225) and the United States (\$4,120). In Columns 3-7 we calculate the value of average transfers by quintiles and in Columns 8-12 we calculate the share of the total pie that goes to each quintile. Comparing by quintiles, average transfers are 26% higher in the United States than in Europe for the bottom quintile; are of the same size for the second and third quintiles; and are 25% higher in Europe for the fourth quintile and 20% for the

Table 3: Cash Transfers by income quintiles

		Average transfers					Percentage of total transfers				
	All	1stQ	2ndQ	3rdQ	4thQ	5thQ	1stQ	2ndQ	3rdQ	4thQ	5thQ
Austria	3546	3468	3693	3592	3130	3845	19.57	20.87	20.23	17.66	21.68
Belgium	3015	4299	3468	2511	2117	2677	28.58	23.01	16.62	14.06	17.73
Denmark	2749	4587	3374	2244	1669	1868	33.37	24.57	16.39	12.11	13.56
Finland	2183	2738	2588	2008	1846	1734	25.12	23.68	18.46	16.88	15.87
France	3066	2626	3071	2776	2664	4195	17.15	20.01	18.11	17.37	27.36
Germany	3073	3128	3038	2946	2920	3336	20.37	19.76	19.17	19.01	21.69
Greece	1613	1278	1612	1511	1530	2140	15.99	19.82	18.72	18.95	26.51
Ireland	1770	2986	1790	1453	1472	1143	33.85	20.18	16.48	16.61	12.89
Italy	2173	1250	1999	2419	2325	2875	11.51	18.39	22.28	21.38	26.44
Luxemb	4970	3953	5190	6316	5022	4369	15.92	20.93	25.37	20.21	17.57
Netherl	2678	2449	2655	2144	2323	3818	18.29	19.83	16.05	17.32	28.51
Portugal	1620	1428	1492	1191	1360	2631	17.64	18.42	14.69	16.78	32.46
Spain	1985	1815	2017	1866	1986	2243	18.29	20.32	18.81	20.00	22.58
Sweden	2959	3384	3169	2933	2592	2718	22.91	21.38	19.84	17.53	18.34
UK	2334	2959	2901	2144	1714	1953	25.38	24.84	18.37	14.69	16.73
EU-15	2584	2531	2674	2444	2324	2947	19.61	20.69	18.92	17.98	22.80
USA	2105	2293	2202	2032	1670	2328	21.79	20.93	19.30	15.87	22.11

Table 4: Cash plus health Transfers by income quintiles

		Average transfers					Percentage of total transfers				
	All	1stQ	2ndQ	3rdQ	4thQ	5thQ	1stQ	2ndQ	3rdQ	4thQ	5thQ
Austria	5410	5735	5540	5317	4794	5663	21.20	20.51	19.63	17.73	20.92
Belgium	4741	6631	5288	4040	3538	4204	28.03	22.31	17.00	14.94	17.71
Denmark	4711	7210	5289	4011	3390	3649	30.61	22.48	17.10	14.35	15.46
Finland	3471	4109	3902	3228	3095	3022	23.71	22.45	18.66	17.79	17.39
France	4923	4617	4997	4560	4392	6053	18.78	20.27	18.53	17.83	24.59
Germany	5171	5238	5124	4993	4997	5504	20.27	19.81	19.31	19.33	21.27
Greece	2463	2344	2504	2309	2284	2877	19.21	20.17	18.74	18.52	23.35
Ireland	3096	4790	3038	2653	2674	2316	31.04	19.58	17.19	17.25	14.93
Italy	3673	2732	3543	3960	3781	4352	14.88	19.29	21.57	20.58	23.68
Luxemb	7633	6413	7909	9256	7648	6940	16.81	20.77	24.21	20.04	18.17
Netherl	4102	3856	4130	3475	3706	5342	18.81	20.13	16.98	18.04	26.04
Portugal	2797	2890	2735	2266	2413	3684	20.68	19.55	16.19	17.25	26.32
Spain	3074	3056	3176	2911	3002	3223	19.89	20.67	18.96	19.53	20.96
Sweden	4887	5487	5154	4804	4410	4581	22.49	21.06	19.68	18.05	18.72
UK	3838	4730	4560	3576	3053	3268	24.68	23.75	18.63	15.91	17.03
EU-15	4225	4308	4370	4030	3871	4544	20.42	20.67	19.09	18.32	21.50
USA	4120	5443	4440	3844	3086	3787	26.42	21.56	18.66	14.98	18.38

top quintile. To be precise, average transfers for the bottom quintile in the European Union amount to \$4,308, while in the United States they are \$5,443.

In Figure 1 we illustrate the results from Tables 3 and 4. The dotted lines represent average cash transfers per quintile. It seems as if the line corresponding to the European Union were just a parallel shift upwards of the line corresponding to the United States. We represent with bold lines the average value of the sum of cash transfers and health transfers that each of the five quintiles receives. For the European Union the general impression is that the picture is quite similar to the one we obtained with cash transfers only. All income groups get more transfers, but the increase is more or less the same for all of them. In the United States, on the contrary, we see that public health transfers are strongly progressive, since they are heavily concentrated at the bottom of the distribution. We clearly observe that households in the bottom 20% of the income distribution are better treated in the United States, while the opposite happens for the top 40% of the distribution.

## 5 Discussion

It could be the case that the results in Section 4 are very much dependent on the choice of 2000 as the reference year. We chose 2000 because the last wave of the ECHP is 2001, and this corresponds to 2000 data. What we can do is to repeat the exercise with a different reference year. The first wave of the ECHP in which we have data for the 15 countries of the European Union is the 1997 wave, with data corresponding to 1996. So we repeat all our calculations using 1996 as the reference year. We find very similar results. We will briefly comment on them here.<sup>28</sup> Mean transfers to the poor in 1996, including health, are 70% higher in the United States, compared to 54% in 2000 (see Table 2, Column 7). The poverty rate in Europe in 1996 was 9.1% and the fraction of total transfers obtained by the poor was 7.5%. In the United States the poverty rate was 17.7% and the poor obtained 23.7% of total transfers. Regarding average transfers by quintiles, we find that they are 36% and 12% higher in the United States for the bottom quintile and the second quintile, respectively, while they are 11% and 19% higher in Europe for the fourth and fifth quintile, respectively. For the third quintile they are the same on both sides of the

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<sup>28</sup>The results are available from the authors upon request.

**FIGURE 1: TRANSFERS BY QUINTILES (WITH AND WITHOUT HEALTH TRANSFERS)**

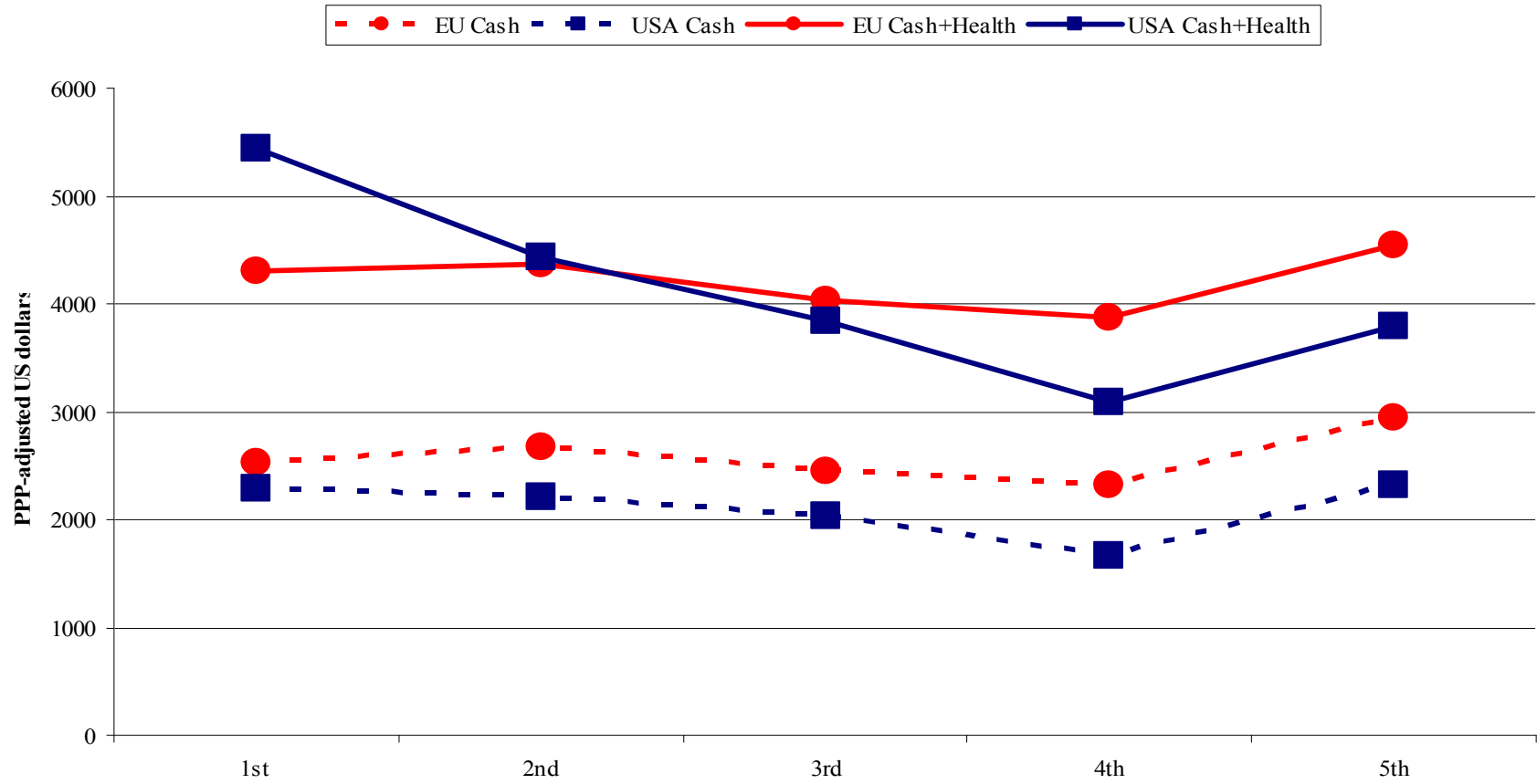


Table 5: Relative Poverty

Household head younger than 65								
			Transfers do not include health services			Transfers include health services		
	Poverty line	Poverty rate	Mean transfers to the poor	Mean transfers to the non-poor	% of transfers received by the poor	Mean transfers to the poor	Mean transfers to the non-poor	% of transfers received by the poor
Austria	9232	6.7	1910	2394	5.5	3228	3857	5.7
Belgium	9270	5.9	3124	1728	10.2	4451	2981	8.6
Denmark	11295	5.0	2212	1748	6.2	3690	3385	5.4
Finland	8397	6.7	1748	1471	7.8	2664	2544	7.0
France	8421	8.2	1612	1571	8.4	2937	2966	8.2
Germany	9077	6.2	2483	1812	8.4	4113	3542	7.2
Greece	4187	13.1	463	899	7.2	1124	1556	9.8
Ireland	8585	11.9	1968	1034	20.5	3042	2114	16.3
Italy	5902	13.8	460	1355	5.2	1590	2620	8.9
Luxemb	13734	7.6	2390	3226	5.7	4231	5383	6.0
Netherl	7789	7.3	1314	1345	7.2	2348	2508	6.9
Portugal	3556	12.4	538	1017	7.0	1396	1948	9.2
Spain	5363	12.6	754	1081	9.1	1549	1952	10.2
Sweden	9212	6.2	1878	1886	6.2	3186	3368	5.9
UK	9992	13.1	1774	1253	17.6	2948	2467	15.3
EU-15	–	9.9	1361	1481	9.2	2529	2807	9.0
USA	13116	17.9	1268	1023	21.3	3047	2070	24.3

Table 6: Cash Transfers by income quintiles

Household head younger than 65											
Average transfers							Percentage of total transfers				
	All	1stQ	2ndQ	3rdQ	4thQ	5thQ	1stQ	2ndQ	3rdQ	4thQ	5thQ
Austria	2361	2178	2445	2524	2279	2381	18.49	20.67	21.39	19.29	20.16
Belgium	1810	2793	1683	1422	1295	1857	30.89	18.59	15.74	14.26	20.52
Denmark	1771	2863	2046	1572	1204	1169	32.33	23.18	17.69	13.61	13.19
Finland	1490	2048	1790	1326	1177	1106	27.56	24.02	17.82	15.78	14.82
France	1574	1644	1605	1344	1297	1982	20.90	20.39	17.09	16.45	25.17
Germany	1853	2320	1709	1705	1682	1851	25.07	18.43	18.41	18.14	19.95
Greece	842	517	608	770	910	1405	12.29	14.44	18.34	21.57	33.36
Ireland	1145	1800	1195	974	1001	755	31.49	20.86	17.02	17.47	13.16
Italy	1231	494	921	1289	1540	1915	8.03	14.93	20.96	25.00	31.08
Luxemb	3163	2883	3022	3523	3236	3152	18.24	19.17	22.26	20.43	19.90
Netherl	1343	1578	1235	1159	1185	1559	23.54	18.37	17.29	17.60	23.21
Portugal	957	622	753	759	837	1815	13.00	15.75	15.88	17.47	37.90
Spain	1040	663	874	1034	1289	1342	12.77	16.79	19.88	24.78	25.78
Sweden	1886	2337	1861	1734	1855	1642	24.79	19.76	18.41	19.64	17.40
UK	1322	1959	1421	1202	1004	1021	29.66	21.50	18.23	15.17	15.45
EU-15	1470	1585	1383	1358	1374	1647	21.60	18.81	18.50	18.68	22.41
USA	1067	1236	925	904	909	1360	23.17	17.34	16.95	17.04	25.50

Table 7: Cash plus health Transfers by income quintiles

Household head younger than 65											
Average transfers							Percentage of total transfers				
	All	1stQ	2ndQ	3rdQ	4thQ	5thQ	1stQ	2ndQ	3rdQ	4thQ	5thQ
Austria	3814	3498	3842	3981	3760	3991	18.38	20.10	20.89	19.71	20.92
Belgium	3069	4067	2899	2634	2533	3209	26.53	18.89	17.20	16.46	20.91
Denmark	3401	4449	3694	3179	2816	2862	26.17	21.80	18.64	16.58	16.82
Finland	2552	3014	2814	2353	2289	2287	23.68	22.04	18.46	17.92	17.90
France	2963	2914	2966	2699	2725	3513	19.68	20.01	18.24	18.37	23.70
Germany	3577	3938	3309	3405	3462	3772	22.05	18.50	19.04	19.34	21.07
Greece	1500	1182	1248	1428	1570	2071	15.77	16.64	19.09	20.90	27.60
Ireland	2225	2864	2250	2052	2099	1856	25.79	20.22	18.46	18.86	16.66
Italy	2478	1620	2114	2552	2848	3257	13.10	17.03	20.62	22.97	26.27
Luxemb	5295	4780	4995	5741	5450	5513	18.06	18.93	21.67	20.55	20.79
Netherl	2496	2648	2317	2279	2389	2845	21.26	18.55	18.30	19.10	22.79
Portugal	1880	1497	1675	1699	1760	2768	15.93	17.83	18.09	18.71	29.43
Spain	1901	1445	1714	1916	2202	2229	15.22	18.02	20.16	23.17	23.43
Sweden	3357	3647	3210	3171	3453	3303	21.73	19.15	18.91	20.55	19.67
UK	2530	3149	2660	2417	2206	2217	24.91	21.02	19.15	17.40	17.52
EU-15	2779	2811	2646	2660	2722	3058	20.25	19.03	19.16	19.57	21.99
USA	2245	2966	2141	1946	1858	2315	26.43	19.07	17.33	16.55	20.62



Atlantic.

The second test consists of redoing the exercise for the reference year 2000, eliminating all households where the head is 65 or older. The reason for this is that it has been argued that in many countries transfers are not targeted to the poor, but to the old. We will now review the most important changes with respect to the results in Section 4. The results are gathered in Tables 5-7. Now average transfers both to the poor and to the non-poor are much lower, which is in accordance with the view that most transfers have the old as their target. The main change is that we observe here that the United States gives less transfers in cash than Europe to the poor (\$1,268 versus \$1,361) and to the non-poor (\$1,023 versus \$1,481). However, when we add health transfers this pattern reverses. In the United States transfers per poor person amount to \$3,047, while in Europe they amount to just \$2,529. Again, the result is the opposite when we consider transfers to the non-poor. In Europe the average transfer is \$2,807, higher than the average transfer to the poor. In United States the average transfer to each non-poor individual is \$2,070. In Tables 6 and 7 we present transfers per income quintiles. The results are quite similar to those in Tables 3 and 4. Once we introduce health transfers we observe that the bottom quintile is slightly better treated in the United States than in Europe. Not only that, again it is the only income group for which that happens. All quintiles except the one at the bottom are better treated in Europe.

We perform a third extension that consists of comparing the United States with an average of the nine European countries considered in Smeeding (2006). The idea is that this might be the group of European countries that is most comparable to the United States. This group of countries comprises Austria, Belgium, Finland, Germany, Ireland, Italy, the Netherlands, Sweden, and the United Kingdom. Our main results do not change much. Now cash transfers per poor individual amount to \$2,011, compared to \$2,265 in the United States. For the EU-15 the value was \$1,927. Adding the value of health transfers the United States is still ahead, although the difference is slightly narrower. For the EU-9, average transfers per poor individual, including health, amount to \$3,676, while in the United States they are \$5,484, still 49% higher. We also find that when we consider the reduced version of the European Union, transfers to the non-poor are slightly lower. The average value of cash transfers is \$2,565, while it is \$2,648 for the EU-15 and \$2,072 for the United States. Adding

health, the values are \$4,207, \$4,289, and \$3,840 for the EU-9, EU-15, and the United States, respectively.

## 6 Conclusions

In this paper we have studied whether it is true or not that the European Union is more generous towards the poor than the United States. After reviewing the available evidence we are not convinced of the truth of that assertion. Whatever the case, this does not mean that the authors endorse the claim that the United States is generous to the poor. Another potential explanation would be that the health sector in the United States is less efficient than in Europe.

We agree that our approach has many shortcomings. However, most of them arise from the lack of available information in the ECHP. We think that a better approach would need more detailed information on the different types of public transfers. In particular, the possibility of distinguishing between “welfare” and “non-welfare” transfers would prove very interesting. Another shortcoming of this paper is the fact that we focus on one particular year. We recognize that the ideal measure of poverty in a country should be based on lifetime income. The reason is that we could thus avoid the problem of having households that are only temporarily below the poverty line. We would also have to calculate the discounted value of all net transfers received, where we should be aware of all the contributions paid in order to get those transfers. Obviously this way of dealing with the problem of poverty would be much more demanding in terms of the data that we would need.

There are some previous studies comparing poverty rates in different European countries and the United States, although not directly focused on the role of governmental transfers to alleviate poverty. Smeeding, Rainwater and Burtless (2002) employ the Luxembourg Income Study (LIS) database. The LIS contains comparable income data for twenty-five countries, covering the period 1967 to 1997. They use the LIS to compare the US with several European countries. They conclude that the US has one of the highest poverty rates of all the countries participating in the LIS project, both using relative and absolute poverty levels. However, this database has some limitations. It does not include some countries of the European Union, such as Portugal. Furthermore, the most recent data for some countries are a bit out-of-date.

For example, the last wave for Denmark is 1992 and that for France 1994. Another problem is that in some countries income is in net terms, while in others it is gross income.

Finally, it could be argued that what is interesting is not to compare the size of transfers to the poor across countries, but the extent to which these transfers help to raise families above the poverty line. We agree that this last issue is important, but we argue that the effect of transfers on poverty depends crucially on how those transfers are distributed among the poor. As Hoynes, Page, and Stevens (2006) notice, there are means-tested programs in the United States that have a deep impact on the well-being of the poor, the EITC for example, but have little impact on the poverty rate, because they occur at income levels that are substantially below the poverty line.

## Appendix 1

Here we give detailed information on the construction of all relevant income variables, both for the European Union and the United States.

### 1. European Union

All information for the countries in the European Union comes from the ECHP. We use the 2001 wave, where all income information corresponds to the year 2000. All variables are after-tax. Our definition of income corresponds to total net household income. This is the variable called *hi100* in the ECHP. This variable *hi100* includes all monetary transfers. Monetary transfers (variable *hi130* in the ECHP) includes unemployment benefits (*hi131*), retirement and survivors pensions (*hi132*), family related allowances (*hi133*), sickness/invalidity benefits (*hi134*), education-related allowances (*hi135*) and any other benefits (*hi136*). For France and Finland monetary transfers (*hi130*) are pre-tax. For these two countries, therefore, we multiply the values in the sample by the net/gross factor (*hi020*).

### 2. United States

For the United States all data are from the 2001 wave of the CPS. As opposed to the ECHP, in the CPS all household income variables are stated before taxes. To make the analysis comparable to that of the ECHP, we have to subtract the value of all taxes paid by the household. We define gross before transfers household income  $gy^1$  as:

$$\begin{aligned} gy^1 = & hwsval + hseval + hfrval + hprivpen + \\ & hintval + hdivval + hrntval + hcspval + \\ & halmval + hfinval + hoival, \end{aligned} \tag{1}$$

where, according to the notation of the CPS, *hswval* are wages and salaries, *hseval* is self-employment income, *hfrval* is farm self-employment income, *hprivpen* are private retirement pensions,<sup>29</sup> *hintval* are interest payments, *hdivval* are dividend payments, *hrntval* are rental payments, *hcspval* are child support payments, *halmval* are alimony payments, *hfinval* are financial assistance payments and *hoival* is other income.

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<sup>29</sup>We consider as private pensions company or union pension, regular payments from annuities or paid insurance policies and regular payments from an IRA, Keogh, or 401(k) plan.

Since public transfers in the CPS are also before taxes, we must convert them into after-tax transfers as well. Gross household income after cash transfers is:

$$gy^2 = htotval + hfdval, \quad (2)$$

where *htotval* is total household income and *hfdval* is the value of all food stamps received during the year. Gross social transfers in the CPS are defined as:

$$\begin{aligned} gy^2 - gy^1 = & hucval + hwcval + hssval + hssival + hpawval + hvetval \\ & + hsurval + hdisval + hpubpen + hedval + hfdval, \end{aligned} \quad (3)$$

where *hucval* is unemployment compensation, *hwcval* is worker's compensation, *hssval* are Social Security payments, *hssival* are Supplemental Security benefits, *hpawval* is public assistance, *hvetval* is veterans' payments, *hsurval* is survivor benefits, *hdisval* is disability benefits, *hpubpen* are public retirement pensions,<sup>30</sup> and *hedval* is educational assistance.

We calculate total taxes *t* paid by the household as:

$$t = fed\_tax + statetax + fica + fed\_ret - eit\_cred, \quad (4)$$

where *fed\_tax* is federal income tax liability, *statetax* is state income tax liability, *fica* is Social Security retirement payroll deduction, *fed\_ret* is federal retirement payroll deduction and *eit\_cred* is the amount corresponding to the Earn Income Tax Credit.

Different social transfers are subject to very different tax liabilities. We have to take this fact into account to calculate the value of household income before transfers and the value of social transfers received by the household, net of taxes. We distinguish between two groups of transfers:

(i) Social Security payments

According to US law, the fiscal treatment of Social Security payments depends on two factors: whether it is the only source of income or not, and what the total income value of the tax filer is. In particular, Social Security payments are exempt from taxation if:

1. The person has no other income.

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<sup>30</sup>We consider as public pensions federal government retirement, US military retirement, state or local government retirement and US railroad retirement.

2. The person files a federal tax return as an “individual” and her combined income is smaller than \$25,000.<sup>31</sup>
3. The person files a joint return and total combined income is smaller than \$32,000.

Half of the Social Security payments are tax exempt and half are taxable in the following cases:

1. The person files a federal tax return as an “individual” and her combined income is between \$25,000 and \$34,000.
2. The person files a joint return and total combined income is between \$32,000 and \$44,000.

Finally, 15% of the Social Security payments are tax exempt and 85% are taxable in the following cases:

1. The person files a federal tax return as an “individual” and her combined income is larger than \$34,000.
2. The person files a joint return and combined income is larger than \$44,000.

(ii) All other social transfers

All remaining social transfers can be split into two categories according to whether they pay or they do not pay taxes. Transfers that do not pay taxes are: worker’s compensation, Supplemental Security benefits, public assistance, veterans’ payments, educational assistance and food stamps. Transfers that pay income tax are: unemployment compensation, survivor benefits, disability benefits, and private retirement pensions. We then define taxable income as:

$$\text{Taxable income} = gy^1 + \text{Gross taxable transfers.} \quad (5)$$

We calculate the average tax rate for each household as:

$$ATR = \frac{\text{Total taxes paid}}{\text{Taxable income}}. \quad (6)$$

We define before transfers household income (net of taxes)  $y^1$  as:

$$y^1 = gy^1 \times (1 - ATR). \quad (7)$$

To get our definition of income that we call  $y^2$  we need to add employer-provided health insurance which is non-taxable and all monetary transfers. The value of cash

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<sup>31</sup>The combined income is the sum of the adjusted gross income plus one-half of the Social Security benefits.

transfers, net of taxes is:

$$\text{Social transfers} = \text{Gross taxable transfers} \times (1 - \text{ATR}) + \text{Tax exempt transfers}, \quad (8)$$

Then we have:

$$y^2 = y^1 + \text{hemcontrb} + \text{Social transfers}, \quad (9)$$

where *hemcontrb* represents the value of employer-provided health insurance. Notice that total taxes paid can be negative due to the existence of the Earn Income Tax Credit (EITC) program. If that is the case we set the value of the average tax rate equal to zero and all negative taxes are considered as a social transfer.

## Appendix 2. Calculation of the monetary value of health transfers

Suppose that for a given country the age profile is:

$$(a_{0-4}, a_{5-9}, a_{10-14}, \dots, a_{95+}), \quad (10)$$

where  $a_{0-4}$  represents the percentage of GDP per capita spent by the government on each individual in the age group 0-4, etc. We first normalize this vector by dividing all components by  $a_{0-4}$ . We get a normalized vector as follows:

$$(1, b_{5-9}, b_{10-14}, \dots, b_{95+}) \equiv \left( \frac{a_{0-4}}{a_{0-4}}, \frac{a_{5-9}}{a_{0-4}}, \frac{a_{10-14}}{a_{0-4}}, \dots, \frac{a_{95+}}{a_{0-4}} \right). \quad (11)$$

Our next task is to determine the per capita expenditure that we are going to attribute to every individual within each of the age groups. To do it, we call  $c$  the value that we are going to impute to each individual in the group 0-4 in a given country. This value must satisfy:

$$\frac{1}{n}(c \times n_{0-4} + (c \times b_{5-9}) \times n_{5-9} + \dots + (c \times b_{95+}) \times n_{95+}) = d, \quad (12)$$

where  $n$  is the total number of individuals in the sample,  $n_h$  is the number of individuals in the sample with age  $h$ , and  $d$  is per capita health expenditure. Clearly, the only unknown in the above equation is  $c$ , which is easily solved. Finally, the imputed values of health transfers for individuals across age groups will be  $c$ ,  $c \times b_{5-9}, \dots$ ,  $c \times b_{95+}$ .

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