

Income inequality and redistribution in five countries

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Introduction and summary

Policymakers designing or changing a country's tax and transfer system aim at redistributing income and supporting the living standards of low-income families, while at the same time encouraging work effort and economic self-sufficiency. Indeed, there is a tradeoff between redistribution and efficiency: Economic theory suggests that transferring more income to the poor tends both to reduce their work effort and to distort the economic decisions of those who are taxed to provide the revenues that are being redistributed. There are several reasons why a government might want to redistribute income. Some of these are linked to the fact that people face different opportunities and different outcomes.

The government might want to provide insurance to its citizens against different outcomes, for example, sickness or unemployment, because in some cases private markets cannot work well. Moreover, not everybody enjoys the same opportunities in life; for example, people from poor family backgrounds are at a disadvantage relative to those from wealthier backgrounds, and transfers are a way to partly offset these differences.¹

For historical and social reasons, different countries put different weights on the costs and benefits of redistributing income. Traditionally, Anglo-Saxon countries have a relatively low degree of government intervention in the economy and place more emphasis on incentives, while in many European countries, we see relatively more government redistribution, greater provision of public goods, and more emphasis on equality of opportunities and outcomes. Our goal in this article is to look at different countries, study their redistribution policies, and discuss the effects of the redistribution/incentives tradeoff. Since we want to look at countries that display different degrees of government intervention, we pick countries belonging

to both traditions. We focus on a small number of countries to study these issues in detail: the U.S., Canada, Germany, Sweden, and Finland. Our country choices are also limited by the availability of comparable data.

The link between the distribution of income and taxes and transfers is a complex one. Households in each country decide how hard to work, when to retire, and how much to consume and save, taking into account the incentives and disincentives provided by the structure of taxes and transfers in their country. Therefore, the distribution of labor income is itself endogenous and the actual measure of taxes and transfers depends on the labor and saving decisions of the households. Moreover, the distribution of labor income depends on the distribution of human capital, and the government, for example, by subsidizing education, can have an impact on it.²

We focus on distribution of income across working-age households in these five countries because we are interested in labor income (earnings) inequality, abstracting from normal retirement decisions. In fact, at some age most people are retired and their labor income drops while their gross income is supplemented by social security payments, pensions, and other income sources. Looking only at households of working age, however, we ignore another important aspect of redistribution: social security transfers to older people.

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We study income inequality in these five countries and use different income measures to compare the redistributive consequences of taxes and transfers. We also discuss their likely effects on the households' labor, early retirement, and savings decisions. The distinction between transfers and taxes is interesting because transfers are typically not just connected to income, but may be means tested (both asset and income based) or based on a specific condition (for example, being unemployed or a single parent). Taxes are typically not related to means testing and depend much less on specific conditions. They rely mostly on income as the screening signal. Different mixes of taxes and transfers thus correspond to different screening mechanisms employed by each country in redistributing resources and, possibly, different redistributive goals.

All of the measures of income we look at are unequally distributed across countries and their distributions are concentrated and skewed. The U.S. displays the most unequal labor income distribution among the five countries, followed by Finland, Canada, Sweden, and Germany in that order. As we mentioned above, the distribution of labor income depends on the tax and transfer system, as well as on the distribution of human capital. Human capital is linked to education, which in turn is influenced by government subsidies. It is interesting to see that, as a result of all of these forces, the distribution of labor earnings in the countries that traditionally have been more concerned with redistribution (Finland and Sweden) is not necessarily more equal than it is in countries that belong to the Anglo-Saxon tradition of low government intervention (the U.S. and perhaps Canada). Finland is one obvious example of a country with high government intervention and high labor income inequality. Our research indicates that this is partly due to a more pronounced pattern of early retirement in Finland than in all of the other countries. Also, economic theory suggests that unemployment benefits discourage job search and work effort. This could translate into a larger number of unemployed or underemployed, which increases measured inequality in labor earnings.

Even after taxes and transfers, the U.S. displays by far the most unequal distribution for disposable income, followed by Canada, Germany, Finland, and Sweden. According to our data, and consistent with the distinction we discussed above, Finland reduces labor income inequality the most, followed by Sweden, Canada, Germany, and the U.S. Interestingly, Germany engages in little redistribution, but has the most equal distribution of labor earnings among these countries.

Not only do governments redistribute income differently, but they also use different instruments. In order to reduce labor income inequality, Finland and Sweden rely on a very progressive transfer system, while their tax system turns out to be very close to proportional (that is, close to a flat tax rate regime). At the opposite extreme, the U.S. uses taxes and transfers with approximately the same degree of progressivity. Canada and Germany are somewhere in between these extremes, with Canada relying more heavily on progressive transfers than Germany.

The progressivity of the tax and transfer systems is an important indicator of the resulting distortions in households' economic decisions. Another important indicator is given by the total amount of resources redistributed by the government in each country. As a measure, we can use the income tax faced by the average working age household. In our samples the average income tax rates are 16 percent in the U.S., 17 percent in Germany, 21 percent in Canada, 23 percent in Finland, and 25 percent in Sweden. In this sample, the countries with higher average income tax (Finland and Sweden) are also the ones with the least progressive tax systems. Government transfers (social insurance plus means-tested) as a fraction of gross income for the average working age household provide the same ordering of magnitude for redistribution as the average income tax. The average fractions of government transfers are 3 percent in the U.S., 6 percent in Germany, 8 percent in Canada, 15 percent in Finland, and 19 percent in Sweden.

We also look at the impact of transfers, conditional on the labor earnings level. For those in the bottom 10 percent of the labor earnings distribution in the U.S. and Canada, means-tested transfers, rather than social insurance transfers, are the main source of gross income. In contrast, in the other countries, and especially in Sweden, the main source of gross income for the poorest segment of the population is in the form of social insurance transfers.

Looking at the structure of earnings and transfers over the life cycle within each country, we find evidence that Finland and Sweden provide stronger incentives toward early retirement because of both social security and the structure of pension schemes. This explains some of the inequality we observe in the labor earnings distribution in these two countries; once people retire, their labor earnings drop. At the opposite extreme, our data suggest that there is less incentive to retire early in Germany and the U.S.

Our findings are thus consistent with the prediction from economic theory that greater redistribution through taxes and transfers is achieved at the cost of

greater distortions on labor supply and early retirement decisions. Consistent with other theoretical work, we also find that high redistribution countries rely heavily on instruments other than income taxes, such as transfers based on special conditions or means testing, to achieve high levels of redistribution while keeping distortions as low as possible for the beneficiaries.³ This, however, is costly because it generates the need to monitor eligibility. For example, Sweden has special agencies that monitor the job search efforts of the unemployed.

Germany is an interesting case. The level of redistribution through taxes and transfers is low. However, the distribution of labor earnings in Germany is remarkably more equal than in the other countries we consider here. Evidently the government is using other instruments to achieve this level of equality, possibly more equal access to public education. Another reason the distribution of earnings may be more equal is the presence of powerful unions, which typically favor a flat wage structure that enhances security at the expense of incentives.

Definitions of income

In this section we review the different definitions of income we use throughout the article and the information they convey. Our unit of analysis is the household, and the first measure of income we consider is labor income (earnings). This includes gross wage, salary income, and farm and nonfarm self-employment income.⁴ This measure provides us with information on the outcome of labor supply and early retirement decisions. Observing a large number of households with little or no earnings is an indication of high unemployment and/or a low participation rate. High levels of concentration in earnings might reflect a more unequal distribution of human capital and education in the population.

Our second measure of income is factor income which, besides earnings, includes cash property income (that is, cash interest, rents, dividends, and annuities) and royalties, but excludes capital gains and all other forms of lump-sum payments. Factor income, including income from capital, gives us a more comprehensive measure of income and provides indirect information on people's assets and, hence, saving decisions.

Another measure of income is gross income, which adds social and private transfers to factor income. Government transfers might be an important channel through which the government redistributes income. Comparing the distribution of factor income with the one for gross income, we can study the effects of government transfers across different countries.

Finally, we calculate disposable income by subtracting income taxes, mandatory employee contributions, and mandatory contributions for the self-employed from gross income. Disposable personal income provides a measure of the resources that households can actually allocate to either savings or consumption after taxes are paid and allows us to compare the progressivity of tax systems across different countries.

All of our statistics are based on total family income, without correcting for the number of family members. We also performed the computations taking into account family size to check whether different demographic patterns across countries affect our conclusions. To do so, we followed the "equivalence scale" literature and divided total family income for each family by the total number of family components, raised to the power α .⁵ This method is meant to take into account that economies of scale arise as the size of the household increases. Our conclusions were not affected by this transformation.

The data

We use the Luxembourg Income Study (LIS) dataset. LIS collects existing household income surveys data from 25 countries and makes them comparable as much as possible in terms of data definition. The LIS dataset for the U.S. is based on the March *Current Population Survey* (CPS), the one for Canada on the *Survey of Consumer Finances*, the one for Germany on the *German Socio-Economic Panel Study*, the one for Sweden on the *Income Distribution Survey*, and the one for Finland on the *Income Distribution Survey*. The LIS provides data in waves; most of the datasets we use belong to the fourth wave. We use 1994 data for the U.S., Canada, and Germany and 1995 data for Finland. We use 1992 data for Sweden, because the 1995 Swedish dataset is still under revision.

The dataset has some limitations. These mainly stem from the fact that the data for the various countries come from existing datasets and might differ in the questions asked, their design, the definition of the household, and other important dimensions. While LIS aims at harmonizing the data so that the effect of these discrepancies is reduced, some differences will persist. Our minimum requirement to include a country was to have data on gross earnings, transfers, and taxes. This criterion alone excluded many countries, such as Italy and France, for which the only data available are net of taxes.

We provide a technical description of the country-specific datasets and their construction in the appendix.

LIS does not provide this information for the specific waves we use. We still report it, indicating to which year it refers, since it provides insight on the quality of the data across countries.

An overview of income inequality across countries

As we said earlier, we are interested in labor income inequality and redistribution. We do not have data on retirement status for all countries. Therefore, we concentrate on households whose head is of working age (25 to 60 years old, table 1). To study the possible effects of different patterns of early retirement on the income distribution, we also look at the subset of families whose head is 25 to 50 years of age (table 2). This will make quite a difference in the income distribution of some of the countries we consider but it will not matter much for others. We provide evidence in a later section that this is, indeed, related to early retirement decisions.

Tables 1 and 2 show that for both subsamples, earnings, factor income, gross income, and disposable income are unequally distributed across households in all of the countries and their distributions are concentrated and skewed (there are a large number of people with little and a small number of people with really large income of any type). The tables also show that governments redistribute with different strength and using different instruments.

The first column of each table reports the fraction of people with zero or negative earnings, factor income, gross income, and disposable income. In the dataset, all of the people with negative earnings are households with self-employment income in financial trouble.⁶

Looking at table 1 we see that the fraction of households at zero or negative earnings varies somewhat across these countries, with Finland having the highest fraction (9.7 percent) and Germany the lowest (7.0 percent). However, once all sources of income are taken into account and taxes are subtracted, this fraction drops below 1 percent for all countries, with the U.S. having the highest fraction of households with zero or negative disposable income (.9 percent) and Finland the lowest (.1 percent). Comparing the number of people with zero or negative earnings and factor income, we see that in all countries the fraction of people in this category falls when cash property

TABLE 1				
Measures of earnings, income, and disposable income: Age 25–60				
Country and variable	Fraction with zero or negative	Concentration		Percentile location of mean
		Gini	p80/p20	
United States				
Earnings	7.7	0.46	23	60
Factor income	6.1	0.46	23	61
Gross income	0.9	0.42	12	62
Disposable income	0.9	0.39	9	60
Canada				
Earnings	8.9	0.42	24	56
Factor income	7.7	0.42	22	56
Gross income	0.2	0.35	8	58
Disposable income	0.2	0.32	6	56
Germany				
Earnings	7.0	0.38	13	56
Factor income	6.2	0.39	14	57
Gross income	0.2	0.34	7	59
Disposable income	0.2	0.30	5	58
Sweden				
Earnings	7.6	0.39	19	56
Factor income	3.7	0.39	17	57
Gross income	0.3	0.29	5	54
Disposable income	0.3	0.27	4	53
Finland				
Earnings	9.7	0.43	39	56
Factor income	7.8	0.44	36	57
Gross income	0.0	0.32	6	57
Disposable income	0.1	0.29	5	55

Notes: The Gini coefficient is a measure of inequality which varies between 0 and 1. 0 indicates perfect equality. 1 indicates perfect inequality (see box 1). The variable p80/p20 is a measure of social distance. It measures the ratio of the average income of the richest and poorest 20 percent of the population.

Sources: Luxembourg Income Study, 1994, dataset for the U.S., Canada, and Germany, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies; 1995, dataset for Finland; and 1992, dataset for Sweden.

income is added.⁷ Most of the people at negative earnings are entrepreneurs in trouble who are experiencing (possibly temporary) losses but still have capital income from their investments; this explains the bulk of the reduction in the number of people at zero or negative factor income, compared with zero or negative earnings. Moreover, comparing table 1 with table 2, we see that the heads of some of the households at zero earnings are older than 50, so they might be in early retirement, and have some income from assets, pensions, and social security transfers. Looking at gross income, we see how private and public transfers reduce the number of people at zero or negative gross income across all countries. Most of this reduction is due to public transfers.

TABLE 2				
Measures of earnings, income, and disposable income: Age 25–50				
Country and variable	Fraction with zero or negative	Concentration		Percentile location of mean
		Gini	p80/p20	
United States				
Earnings	6.8	0.45	21	59
Factor income	5.8	0.45	21	61
Gross income	0.9	0.42	11	62
Disposable income	0.9	0.38	9	60
Canada				
Earnings	7.6	0.41	19	55
Factor income	7.1	0.40	18	56
Gross income	0.2	0.34	7	57
Disposable income	0.2	0.31	6	56
Germany				
Earnings	5.9	0.38	12	56
Factor income	5.4	0.38	12	56
Gross income	0.0	0.34	6	58
Disposable income	0.0	0.30	5	57
Sweden				
Earnings	6.7	0.39	17	57
Factor income	3.5	0.39	16	57
Gross income	0.3	0.29	4	54
Disposable income	0.3	0.27	4	53
Finland				
Earnings	7.2	0.40	21	56
Factor income	6.3	0.41	20	57
Gross income	0.0	0.31	5	57
Disposable income	0.1	0.28	4	54

Notes: The Gini coefficient is a measure of inequality which varies between 0 and 1. 0 indicates perfect equality. 1 indicates perfect inequality (see box 1). The variable p80/p20 is a measure of social distance. It measures the ratio of the average income of the richest and poorest 20 percent of the population.

Sources: Luxembourg Income Study, 1994, dataset for the U.S., Canada, and Germany, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies; 1995, dataset for Finland; and 1992, dataset for Sweden.

The second column reports the Gini coefficient (see box 1), which is a measure of inequality. The U.S. displays the highest concentration for all income measures, Germany has the least concentrated earnings distribution, and Sweden has the least concentration in the gross and disposable income distributions.⁸ There is some evidence that Germany achieves redistribution using some other mechanism that makes labor earnings more equal.

The drop in the Gini index from one row to the next measures the reduction in inequality. We see that Finland achieves more redistribution (its Gini coefficient for disposable income is 34 percent lower than its Gini coefficient for factor income), most of which comes from transfers. Sweden is quite close to Finland,

both in the size of the redistribution and the use of transfers to achieve it. At the opposite extreme, in the U.S. the combined effect of taxes and transfers reduces the factor income Gini coefficient by 15 percent, and transfers cause only about half of the reduction. Canada and Germany are somewhere in between, with Canada relying more heavily on transfers than Germany.

The fourth column of the tables reports another measure of concentration. Let us take earnings: p80/p20 is the ratio between the total earnings of the richest 20 percent, divided by the total earnings of the poorest 20 percent. This is a measure of “social distance,” comparing the richest population segment with the poorest.⁹

In table 1, the p80/p20 earnings ratio varies between a high of 39 for Finland and a low of 13 for Germany. The ratio in Finland is high not because the richest people make more here than in the other countries, but because the average earnings of the poorest 20 percent are low compared with the other countries. After taxes and transfers, the p80/p20 ratio for disposable income falls noticeably. In all countries but the U.S. this is mostly due to transfer systems that increase significantly the gross income of the poorest, rather than to tax systems that reduce more than proportionally the average disposable income of the richest. The p80/p20 for disposable income is highest in the U.S. (9) and lowest in Sweden (4).

Comparing table 1 and table 2, we see that restricting our sample to households whose head is 50 and younger makes a difference, especially for Finland, Canada, and Sweden. For example, p80/p20, the measure of social distance from richest 20 percent to poorest 20 percent, drops from 39 to 21 for Finland when we change the upper age limit from 60 to 50. However, it makes little difference for the U.S. and no difference for Germany. This suggests that people might retire earlier in some countries than in others. According to the Gini coefficient for earnings reported in table 2, the U.S. is still the country with the highest earnings inequality, followed by Canada, Finland, Sweden, and Germany.

The last column, percentile location of mean, provides information on the skewness of the distribution.

This measure reveals that in the U.S. the distributions are more skewed, both before and after taxes and transfers. The distributions of earnings and factor income are similarly skewed in Canada, Germany, Sweden, and Finland, while Sweden displays less skewness in its distribution of disposable income.

Using Lorenz curves to better understand inequality

Figure 1 compares the Lorenz curve for earnings across the five countries. As we explain in box 1, the Lorenz curve provides more information than the Gini index, which is a summary measure of inequality. It is

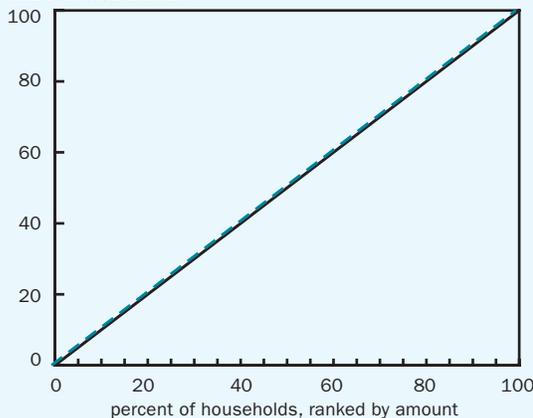
BOX 1

Lorenz curve and Gini coefficient

The Lorenz curve provides information on inequality. To draw it, we first sort the households by their income, starting with the ones with the lowest income. We then plot the relationship between the cumulative percentage of the population (on the horizontal axis) and the proportion of total income earned by each cumulative percentage (on the vertical axis). Figures a and b show the Lorenz curve for the two extreme cases of perfect equality and highest inequality. In the case of perfect equality

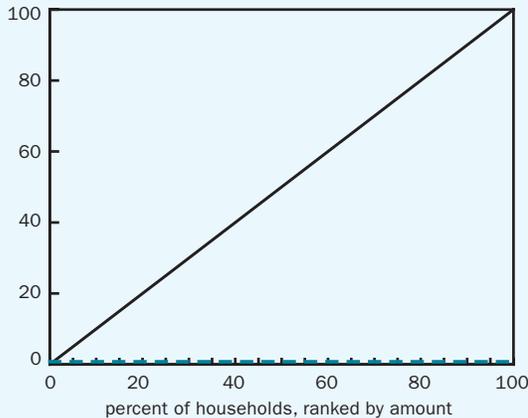
a. Perfect equality

share of total income



b. Perfect inequality

share of total income

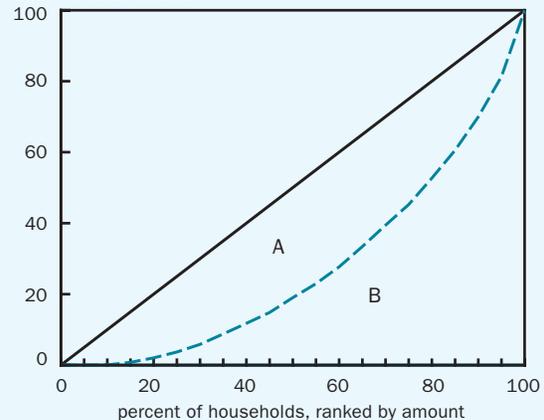


everybody earns the same proportion of total income, and the Lorenz curve coincides with the 45-degree line (see figure a). In the case of perfect inequality, just one family earns all of the total income in the economy. All households except the last one earn no income, and hence the cumulative proportion of income earned stays at zero. The Lorenz curve stays flat until the very last household is reached; then it jumps to 100, since the last family earns all of the income in the economy.

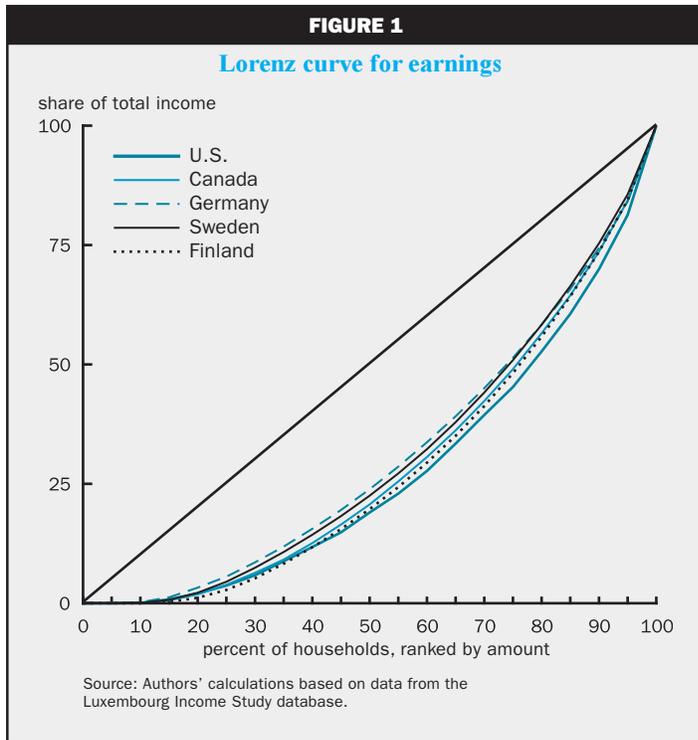
In real life we observe intermediate cases, in which some households earn more and others less, and the Lorenz curve lies between the perfect equality and the perfect inequality lines (figure c).

c. Intermediate case

share of total income



The Gini coefficient is a summary statistic of inequality derived from the Lorenz curve. It is defined as the ratio of area A (see figure c: the area between the Lorenz curve and the perfect equality line) to area A + B (the area between the perfect equality and perfect inequality lines). The Gini coefficient varies between zero and one; it is equal to zero in the case of perfect equality (every household earns the same) and equal to one in the case of perfect inequality (one household earns everything). Therefore, the Gini coefficient provides a summary measure of inequality over the whole range of the distribution.



interesting to observe not only the ordering of the curves for the various countries (the ones that lie to the right are the farthest from the 45-degree line and thus indicate a country with more inequality), but also whether the lines cross and where. Until the thirty-fifth percentile, Finland is the country in which the poorest families earn the smallest fraction of total earnings. From that percentile on, the U.S. emerges as having greater income inequality than Finland or any of the other countries we study.

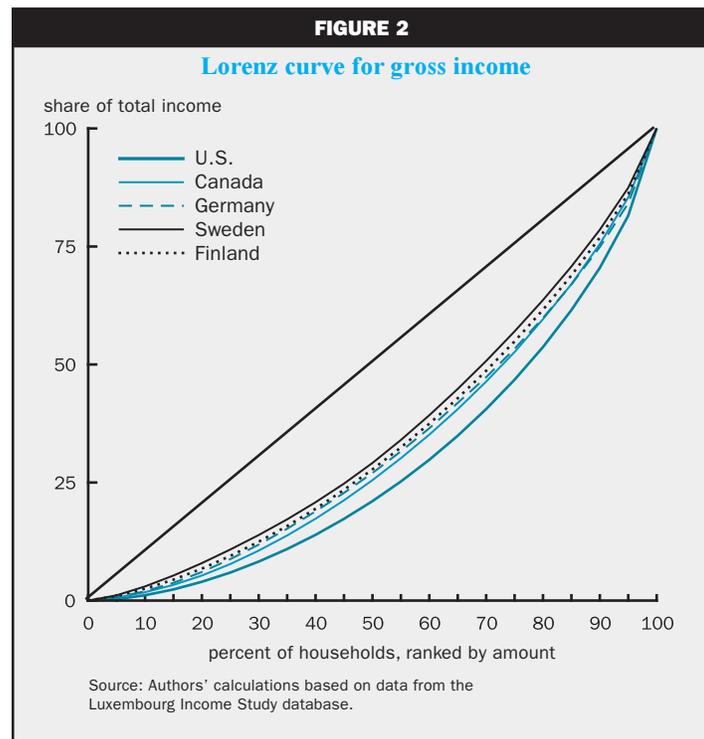
Economic theory (for a survey, see Mortensen and Pissarides, 1999) suggests that workers' labor decisions depend, among other things, on the social security safety net that is in place: In countries with more generous social insurance systems (such as unemployment benefits), workers will be pickier and there will be more people with zero earnings, since they receive transfers from the government. In this case, the workers are deciding not to work, or not to work for a longer period because of the availability of benefits; thus, they may be better off than the workers in countries that do not offer such generous benefits. The incentives to retire early also affect the

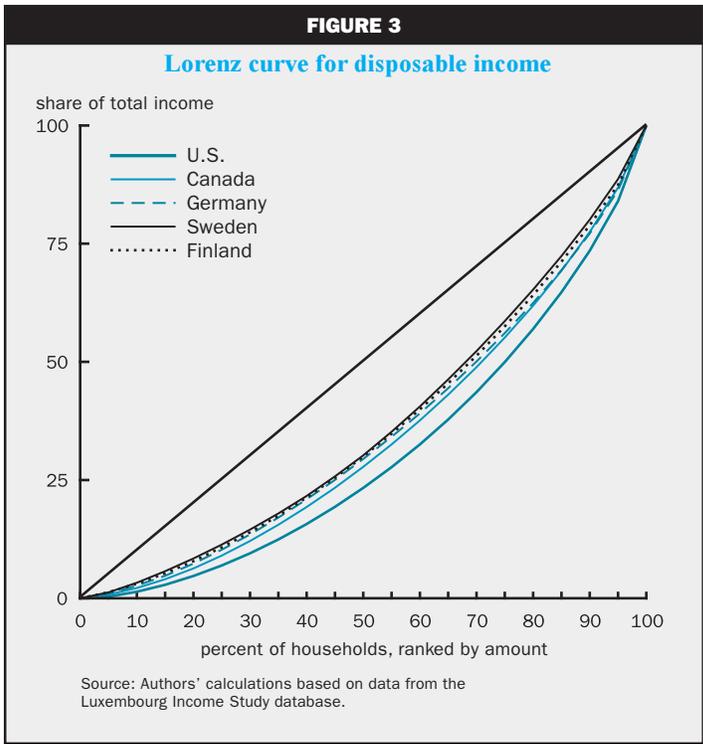
number of people at low levels of earnings.¹⁰ These incentives differ across countries, and we provide evidence that they are particularly strong in Finland.

Looking at the earnings of households between the fortieth and eightieth percentiles, the ordering of the countries from most equal to most unequal is Germany, Sweden, Canada, Finland, and the U.S.

Figure 2 displays the Lorenz curves for gross income across the five countries.¹¹ After adding private and government transfers, the U.S. displays the most concentrated distribution by far for all percentiles. Until the eighty-fifth percentile, the ordering of gross income inequality from the most equal to the most unequal is Sweden, Finland, Germany, Canada, and the U.S. After adding transfers, the poorest people in the other countries are noticeably better off than in the U.S. This is not the case for the earnings distributions in figure 1. As we discussed for table 1, transfers go a long way in redistributing income, especially at the lower levels of

earnings. For all countries but the U.S. and Germany, they are the instrument most used to redistribute income. However, economic theory predicts that a





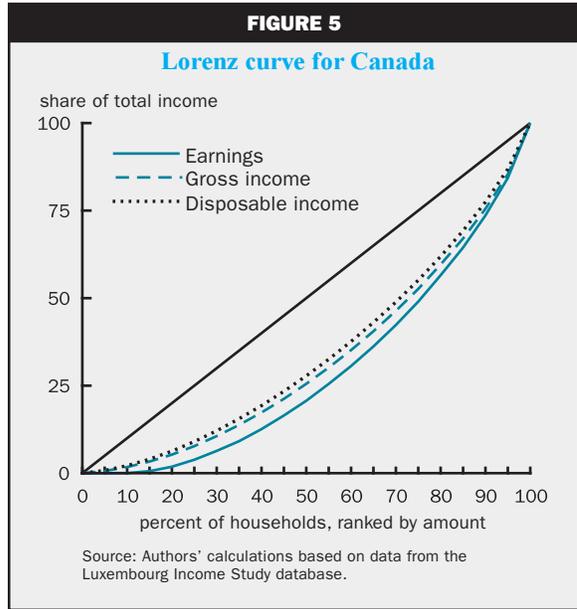
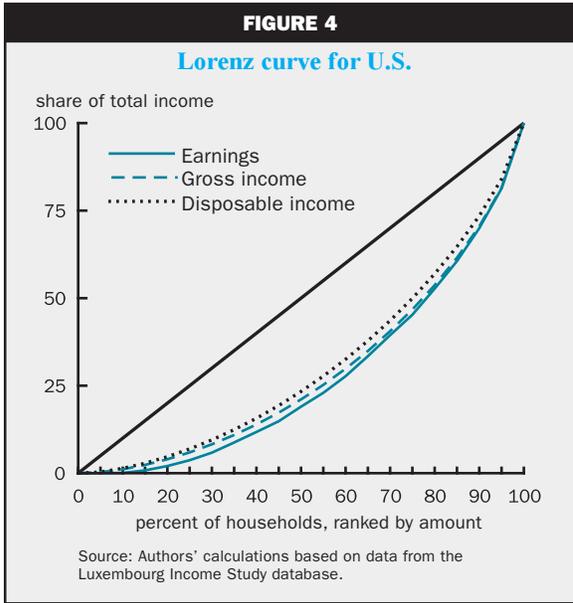
generous transfer system influences labor supply and early retirement decisions, increasing the number of people at zero earnings and reducing labor supply even at higher levels.

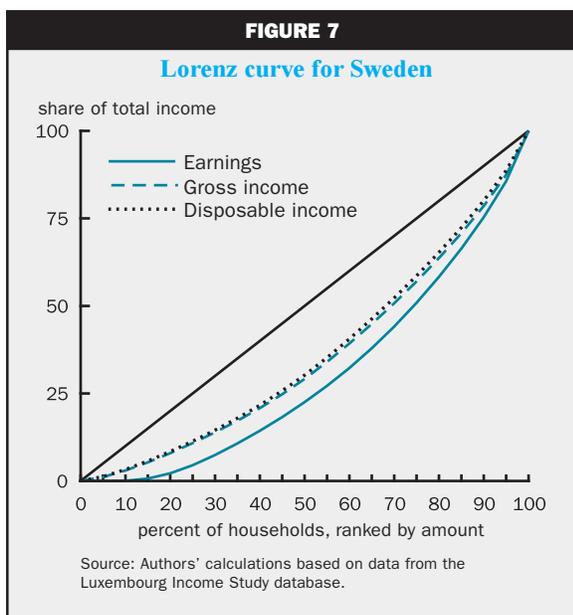
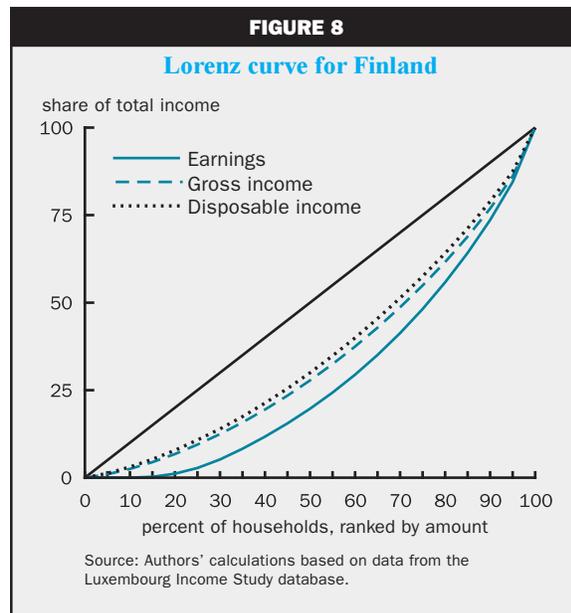
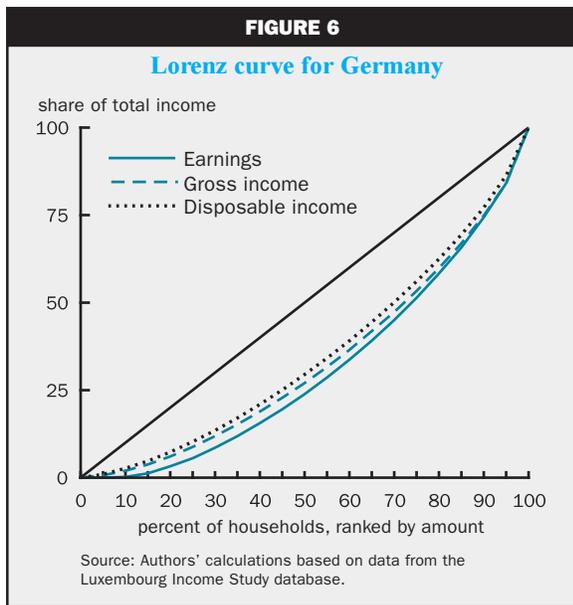
Figure 3 shows the Lorenz curves for disposable income. As in figure 2, the Lorenz curve for the U.S. is by far the most concentrated at all percentiles. The Lorenz curves for Sweden, Finland, and Germany

are closer than the ones for gross earnings and almost coincide for the poorest 60 percent of the population. High redistribution countries rely heavily on instruments other than income taxes, such as transfers based on special conditions or means testing, to achieve high levels of redistribution while keeping distortions as low as possible for the beneficiaries. As we mentioned earlier, however, this is costly because it generates the need to monitor eligibility.

Figures 4 to 8 display the Lorenz curves for earnings, gross income, and disposable income within each country. Comparing the figures, we see that the U.S. and Germany redistribute income across households using transfers and taxes roughly with the same intensity, with transfers having the strongest impact for families below the median earner family and taxes becoming more redistributive for families above the twenty-fifth percentile. In Canada, the effect of transfers shifts the Lorenz curve for gross income more than it does in the U.S. Both Sweden and Finland have very

high levels of redistributions by means of transfers, also for families high up in the distribution, while taxation shifts the Lorenz curve relatively little in both cases. We should notice that proportional taxation (income is taxed at the same marginal rate, regardless of the income level) and proportional transfers do not shift the Lorenz curve and do not change the Gini coefficient. Conversely, progressive taxation (higher income is





taxed at a higher marginal rate) and transfers do. Therefore, our comparison shows that the Swedish and Finnish tax systems are effectively close to a proportional tax and all of the progressivity is achieved through transfers. Taxation is more progressive in the U.S., Canada, and Germany.

So far, we have discussed the progressivity of the tax and transfer systems in our five countries based on how they change the relative position of the households in the income distribution. However, this criterion does not give us much information about the magnitude of the income that changes hands in

the economy. From the last columns of tables 3 to 7, we can look at another measure of redistribution within each country: aggregate taxes and transfers as a fraction of aggregate gross income. Looking at this criterion, we see that total transfers are 6 percent of gross income of the working age families in the U.S., 11 percent in Canada, 7 percent in Germany, 19 percent in Sweden, and 21 percent in Finland. For income taxes, the numbers are 16 percent, 21 percent, 17 percent, 25 percent, and 23 percent of gross income, respectively. The magnitude of these flows provides the same ordering of strength of redistribution across countries suggested by the Lorenz curves and the Gini coefficients.

Labor earnings and redistribution

Tables 3 to 7 provide more detail on earnings, taxes, and transfers for households whose head is 25 to 60 years of age, conditional on labor earnings quartiles. In each table, the columns provide information about a number of households, classified according to their relative position in the earnings distribution of the total sample of households: the poorest 10 percent, the quartiles, the richest 10 percent, and the population as a whole.¹² We study average earnings, gross income, and disposable income for the households in each category.¹³ To better understand how redistribution takes place within the quartiles of the earnings distribution, we also analyze the sources of disposable income and tax payments.

We distinguish among various income sources. The first three are gross wage and salary income

(labor), income from self-employment (business), and cash property income. We then distinguish among several transfer components. Social insurance transfers include sick, accident, and disability pay, social retirement benefits (even if the household head is of working age, he or she may go into early retirement or another family member might receive such payments), child or family allowances, unemployment compensation, maternity pay, military/veteran/war benefits, and other social insurance. Means-tested transfers include both cash and near-cash benefits.¹⁴ Pensions include private pensions and public sector pensions. Private pensions are employer payments for retirement that may supplement social security transfers. Self-employment pension plans are included, if they are designed to supplement social security, for example, individual retirement accounts (IRAs). Public sector pensions include pensions for public employees and do not include amounts coming from social security benefits for the aged or survivors. Private transfers include alimony or child support and other regular private income.

We then report income taxes. We do not have information on employee and self-employed

contributions for all five countries. The comparison between income tax rates is likely to carry over to the entire tax system, as the income tax is the most progressive component of the tax code.

We also report some demographic characteristics of households in the different earnings quartiles.

The U.S.

As table 3 shows, the average household at the bottom 10 percent of the earnings distribution in the U.S. earns \$275 from labor income, which amounts to a disposable income of \$9,090 after taxes and transfers. Less than 3 percent of the household's gross income comes from earnings, while 86.4 percent derives from transfers. For this group, means-tested transfers account for the largest share of transfers (37.4 percent), followed by social insurance (26.3 percent) and pensions (13.4 percent). Consistent with the observation that lifetime earnings follow an inverted U shape, the 10 percent of households with the lowest earnings include a disproportionate share of the youngest and oldest population segments. Young people are still accumulating human capital and trying to climb up the earnings distribution. The relatively high fraction

TABLE 3							
U.S. households ranked by earnings							
Household characteristics	Bottom 10%	Households in earnings quartiles				Top 10%	Total
		1st	2nd	3rd	4th		
Earnings, in dollars							
Average earnings	275	6,009	24,494	43,415	89,184	122,085	40,676
Average gross income	9,448	12,295	27,220	46,352	94,395	129,545	44,965
Average disposable income	9,090	11,320	22,791	37,016	68,258	89,275	34,773
Sources of gross income, %							
Labor	2.7	45.2	84.5	88.4	87.6	85.9	84.4
Business	0.2	3.6	5.5	5.3	6.9	8.4	6.0
Cash property income	10.7	6.1	2.5	2.6	3.9	4.6	3.5
Total transfers	86.4	45.1	7.6	3.7	1.6	1.2	6.0
Social insurance	26.3	16.5	3.5	1.6	0.7	0.4	2.4
Means-tested	37.4	15.9	1.0	0.2	0.0	0.0	1.3
Pensions	13.4	7.1	1.7	1.2	0.7	0.6	1.4
Private	7.3	4.8	1.2	0.6	0.2	0.1	0.8
Income tax, %	3.5	4.0	9.4	13.0	21.3	25.2	16.2
Average number of earners	0.3	0.8	1.4	1.8	2.2	2.2	1.5
Average household size	2.3	2.3	2.4	2.9	3.3	3.3	2.7
Age of household head, %							
25–34	32.6	37.9	38.2	29.4	17.1	13.3	30.7
35–49	39.2	39.8	43.5	49.7	56.9	57.4	47.5
50–60	28.2	22.3	18.2	20.9	26.0	29.3	21.8
Average age, years	41.4	39.8	39.3	40.9	43.4	44.4	40.8

Source: Luxembourg Income Study, 1994, dataset for the U.S., Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

of older people (50 to 60 years old) among the lowest earners suggests that a significant number of people in our sample are taking early retirement. As we mentioned earlier, this is a common feature across countries, although it is much more common in Finland and Sweden.

Looking at the overall distribution, we see that transfers decline quickly as earnings increase, with means-tested transfers declining even more quickly. The share of pensions also declines throughout the distribution.

The structure of taxation is very progressive, with the average tax rate going from 3.5 percent for the poorest 10 percent, to 25 percent for the richest 10 percent. However, the average tax rate in the U.S. is low, compared with the other countries we look at.

Canada

Table 4 shows that Canada has a more generous transfer system than the U.S. Both social insurance and means-tested transfers are larger in Canada, but while social insurance transfers decline more slowly as earnings increase, means-tested ones do so more quickly, as households in the second quartile of both

distributions receive less than 1 percent of their gross income from this source. The share of pension income across the distribution looks remarkably similar to the one in the U.S. even though in Canada the fraction of people between 50 and 60 years of age is larger.

The Canadian income tax regime is almost as progressive as the U.S. one. In particular, households at the top 10 percent of the distribution pay an average income tax of 28 percent, compared with 25 percent in the U.S., although for the whole population the average rate is 21 percent in Canada and 16 percent in the U.S.

Germany

The fraction of gross income coming from government transfers (social insurance plus means-tested) for the average household in the total population is 6.4 percent, compared with 3.7 percent in the U.S. and 8 percent in Canada. Interestingly, at the bottom 10 percent of the earnings distribution the share of transfers due to social insurance is larger than the means-tested share in Germany, unlike in the U.S. and Canada.

TABLE 4							
Canadian households ranked by earnings							
Household characteristics	Bottom 10%	Households in earnings quartiles				Top 10%	Total
		1st	2nd	3rd	4th		
Earnings, in U.S. dollars							
Average earnings	68	5,088	22,753	37,856	68,148	88,188	33,408
Average gross income	11,004	13,472	27,281	40,972	71,363	91,807	38,230
Average disposable income	10,412	12,449	22,982	32,570	53,112	66,075	30,246
Sources of gross income							
Labor	0.5	32.7	76.5	87.4	88.1	86.3	80.9
Business	0.1	5.1	6.9	5.0	7.4	9.8	6.5
Cash property income	6.4	4.7	2.0	1.4	1.7	2.0	1.9
Total transfers	93.0	57.6	14.6	6.2	2.8	2.0	10.7
Social insurance	30.6	26.5	10.1	4.4	1.7	1.0	6.1
Means-tested	41.3	18.4	0.8	0.3	0.1	0.1	1.9
Pensions	14.1	7.4	1.7	0.8	0.4	0.3	1.4
Private	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Income tax, %	5.4	7.6	15.8	20.5	25.6	28.0	20.9
Average number of earners	0.1	0.8	1.6	1.9	2.4	2.6	1.7
Average household size	2.1	2.2	2.6	3.0	3.4	3.5	2.8
Age of household head, %							
25–34	28.0	32.1	35.9	29.4	19.2	13.7	29.2
35–49	39.9	42.0	44.8	51.0	55.5	56.8	48.3
50–60	32.2	25.9	19.3	19.5	25.3	29.5	22.5
Average age, years	43.0	41.3	39.8	40.7	43.1	44.4	41.2

Source: Luxembourg Income Study, 1994, dataset for Canada, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

TABLE 5

German households ranked by earnings

Household characteristics	Bottom 10%	Households in earnings quartiles				Top 10%	Total
		1st	2nd	3rd	4th		
Earnings, in U.S. dollars							
Average earnings	867	9,174	30,275	45,496	80,412	106,831	41,333
Average gross income	14,926	18,247	33,344	48,394	84,407	113,440	46,092
Average disposable income	13,584	15,602	24,236	33,921	54,320	70,518	32,016
Sources of gross income, %							
Labor	5.6	44.6	86.9	87.4	85.5	80.6	82.2
Business	0.2	5.7	3.9	6.6	9.8	13.6	7.5
Cash property income	21.4	8.2	1.3	2.0	3.1	4.7	3.0
Total transfers	72.8	41.6	7.9	4.0	1.6	1.1	7.3
Social insurance	36.8	23.4	6.2	3.1	1.3	0.9	4.8
Means-tested	23.5	11.9	1.2	0.5	0.1	0.1	1.6
Pensions	3.3	1.9	0.2	0.3	0.0	0.0	0.3
Private	9.3	4.4	0.4	0.2	0.2	0.2	0.6
Income tax, %	8.7	6.4	11.5	14.6	22.9	27.4	17.0
Average number of earners	0.3	0.8	1.4	1.8	2.1	2.1	1.5
Average household size	1.9	2.1	2.5	2.9	3.1	3.2	2.6
Age of household head, %							
25-34	37.2	39.4	38.0	29.3	19.8	10.7	31.6
35-49	29.7	31.8	36.8	46.0	49.5	51.7	41.0
50-60	33.1	28.8	25.1	24.7	30.7	37.7	27.3
Average age, years	42.0	40.8	40.4	41.5	43.9	45.9	41.7

Source: Luxembourg Income Study, 1994, dataset for Germany, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

The share of gross income due to pensions is low in Germany; for example, at the bottom 10 percent it is only 3.3 percent, compared with about 14 percent in both the U.S. and Canada, despite the fact that the share of people ages 50 to 60 is larger in Germany. This reflects the fact that the German social security system is much less redistributive than in the other countries (see Börsch-Supan and Schnabel, 1999), so the share of payments that goes to the poorest segment of the population is lower.

As we said before, Germany is the country with the second least generous transfer system after the U.S. It is also the country with the second lowest average income tax, 17 percent of total gross income, compared with 16 percent in the U.S., 21 percent in Canada, and much higher rates in Sweden and Finland. However, the bottom 10 percent of households pay more taxes in Germany (8.7 percent) than in the U.S. (3.5 percent) or Canada (5.4 percent).

Sweden

In Sweden, 19 percent of average household gross income is due to transfers, compared with

6 percent in the U.S., 7 percent in Germany, and 11 percent in Canada.¹⁵

Comparing tables 6 and 3 we see that the Swedish households at the bottom 10 percent of the earnings distribution have \$223 in average earnings, compared with \$275 in the U.S., but end up with an average disposable income of \$19,750, compared with \$9,090 in the U.S. They thus receive 92 percent of their gross income from transfers, the majority of which is social assistance (this, however, includes public pensions in Sweden), while a much smaller fraction is means tested. Swedish social security transfers remain large as earnings increase: The households in the top quartile of the earnings distribution receive 5 percent of their gross income from government transfers.

Correspondingly, the average income tax for the whole population is also much larger (25 percent) than in the countries we have discussed so far. Its structure is not very progressive, starting from an average rate of 16 percent for the bottom 10 percent up to 31 percent for the richest 10 percent.

TABLE 6

Swedish households ranked by earnings

Household characteristics	Bottom 10%	Households in earnings quartiles				Top 10%	Total
		1st	2nd	3rd	4th		
Earnings, in U.S. dollars							
Average earnings	223	7,010	28,120	44,315	76,646	96,233	39,020
Average gross income	23,593	26,798	36,960	53,925	84,404	104,351	50,519
Average disposable income	19,750	21,806	28,178	40,821	60,203	71,928	37,750
Sources of gross income, %							
Labor	0.8	23.5	73.7	79.4	88.9	90.2	74.9
Business	0.1	2.7	2.4	2.8	1.9	2.1	2.3
Cash property income	4.2	3.8	2.7	3.5	3.9	3.9	3.6
Total transfers	94.8	70.0	21.2	14.3	5.3	3.9	19.2
Social insurance	73.1	55.0	18.0	13.0	5.0	3.7	16.2
Means-tested	8.6	12.6	2.0	0.9	0.1	0.1	2.3
Pensions	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Private	3.1	2.5	1.2	0.5	0.1	0.1	0.7
Income tax, %	16.3	18.6	23.8	24.3	28.7	31.1	25.3
Average number of earners	0.5	1.0	1.3	1.7	2.1	2.1	1.5
Average household size	1.7	1.8	1.8	2.5	2.9	2.9	2.2
Age of household head, %							
25–34	31.1	39.5	39.9	30.7	13.0	8.2	30.8
35–49	37.9	36.9	40.1	47.6	55.9	59.5	45.1
50–60	31.0	23.5	20.0	21.7	31.0	32.3	24.1
Average age, years	41.6	39.7	39.4	40.9	44.7	45.8	41.2

Note: N/A indicates not available.
Source: Luxembourg Income Study, 1992, dataset for Sweden, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

Finland

As we see from table 7, in Finland as in Sweden, the amount of transfer income is substantial and the part due to social insurance is generous throughout the earnings distribution. In Finland, however, means-tested transfers are more generous than in Sweden, and particularly so at low levels of earnings.

Unlike for Sweden, we do have disaggregated data for pensions for Finland. It is striking to note that pensions provide 36 percent of gross income for the Finnish households at the bottom 10 percent of the distribution and 22 percent for those in the bottom 25 percent. This is more than double the amounts for the U.S and Canada and about ten times the level in Germany. In Finland, 44 percent of household heads age 50 to 60 are in the bottom 10 percent of the distribution and 34 percent are in the bottom 25 percent, compared with 25 percent in the total sample. A large share of this pension income is due to public pensions. The availability and generosity of public pensions in Finland seems to encourage a large share of public employees to retire early.

The average income tax rate and its progressivity in Finland are very similar to those of Sweden. Finland implemented a tax reform in the late 1980s (Organization for Economic Cooperation and Development [OECD], 1991) that reduced marginal income tax rates while maintaining total tax revenues by broadening the income tax base and raising indirect taxes. By 1992, the highest personal income tax rate had been reduced from 51 percent to 39 percent. On the other hand, and partially offsetting this reduction, social security contributions paid by employers and employees were increased. The OECD computed that, taking increases in social security and consumption taxes into account, the effective marginal tax rate on total labor compensation did not change significantly. We do not have data on consumption or consumption taxes; therefore our computed tax payments should be considered as lower bounds of the actual ones.

Age, early retirement, and income

In this section we look at gross income, taxes, and transfers over the life cycle to study the relationship between age and redistribution for working age families (25 to 60 years of age).

TABLE 7

Finnish households ranked by earnings

Household characteristics	Bottom 10%	Households in earnings quartiles				Top 10%	Total
		1st	2nd	3rd	4th		
Earnings, in U.S. dollars							
Average earnings	2	3,722	22,688	38,214	69,544	88,581	33,533
Average gross income	17,423	20,473	31,902	46,374	76,682	97,418	43,851
Average disposable income	14,532	16,783	23,743	32,694	49,611	60,534	30,703
Sources of gross income, %							
Labor	0.0	15.2	64.5	75.0	79.3	76.5	68.0
Business	0.0	3.0	6.6	7.4	11.4	14.4	8.5
Cash property income	2.3	5.8	1.7	2.0	3.0	4.3	2.8
Total transfers	97.7	76.0	27.2	15.6	6.3	4.7	20.7
Social insurance	34.5	32.6	16.0	10.1	4.3	3.0	11.3
Means-tested	25.0	19.0	3.9	1.4	0.5	0.4	3.5
Pensions	36.5	22.1	6.0	3.2	1.0	0.8	5.0
Private	1.4	1.8	1.2	0.7	0.5	0.5	0.8
Income tax, %	13.6	14.7	19.5	22.6	27.7	30.3	23.4
Average number of earners	0.0	0.8	1.5	1.8	2.3	2.4	1.6
Average household size	1.6	1.8	2.3	2.8	3.3	3.4	2.6
Age of household head, %							
25–34	15.8	28.4	37.9	29.2	15.3	11.0	27.7
35–49	39.9	37.5	40.2	50.7	59.9	59.5	47.1
50–60	44.3	34.2	22.0	20.1	24.7	29.4	25.3
Average age, years	46.5	43.2	39.9	41.1	43.6	44.7	42.0

Source: Luxembourg Income Study, 1995, dataset for Finland, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

In all countries average gross income follows an inverse U-shape pattern, first increasing with age and then declining as the household head gets older (tables 8 to 12). Total transfers follow a U-shape pattern: They are more generous for younger and older households. In fact, middle-age families on average earn more and also hold more assets. As the family gets older some of its members retire and begin receiving social security payments and pensions, therefore transfers increase. In all countries but Sweden (for which we do not have data on private pensions), total transfers to the age group 55 to 60 are actually the highest over the life cycle. The fraction of total transfers to this age group is smallest in the U.S. and Germany (11 percent), larger in Canada and Sweden (19 and 22 percent, respectively) and largest in Finland (36 percent).

The incentives to retire early in the various countries are reflected in tables 8 to 12 by the life cycle pattern of the fraction of gross income due to labor, self-employment, and total transfers. If the fraction of total transfers rises significantly for the last (or last two) age groups, while the fraction of income from labor and self-employment goes down,

we have evidence that households are retiring early. The case in which transfers go up and labor income goes down while income from self-employment increases indicates that while households are reducing their labor and receiving social security and pension payments, at the same time they are engaging in some self-employment activity to supplement their income. This is more likely to happen in countries in which social security payments do not decrease sharply when people receive some extra income, at least up to some level.

The composition of total transfers and the changes in transfers as the household ages gives some indication of which programs provide more incentives toward early retirement. In a country with a social security system that has generous provisions for early retirement, we expect to see the fraction of social insurance (which includes social security payments) increase a lot for older households. In a country in which, instead, families retire early because of incentives linked to private and public pension plans, we expect the fraction of pension income to go up.

Tables 8 to 12 show that in Germany pensions are lower than in all of the other countries for all age

TABLE 8

Age and income in the U.S.

Age	Average gross income	Income sources (%)			Transfer sources (%)			Total	Income tax
		Labor	Business	Cash property	Social insurance	Means-tested	Pension		
25-29	28,550	89.4	3.1	1.6	1.9	2.6	0.2	6.0	12.9
30-34	37,454	88.7	4.7	1.4	2.0	2.0	0.3	5.2	14.0
35-39	44,985	86.2	6.2	2.7	2.0	1.5	0.4	4.9	16.0
40-44	48,808	85.6	6.6	3.1	2.2	1.1	0.6	4.8	16.4
45-49	54,959	84.2	7.1	3.8	2.5	0.8	1.0	4.9	17.5
50-54	54,156	81.2	7.0	5.0	3.0	0.9	2.3	6.8	17.5
55-60	49,589	75.4	6.2	7.2	3.6	0.8	6.1	11.2	17.8
Total	44,965	84.4	6.0	3.5	2.4	1.3	1.4	6.0	16.2

Source: Luxembourg Income Study, 1994, dataset for the U.S., Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

TABLE 9

Age and income in Canada

Age	Average gross income	Income sources (%)			Transfer sources (%)			Total	Income tax
		Labor	Business	Cash property	Social insurance	Means-tested	Pension		
25-29	28,707	84.0	4.1	0.9	6.6	3.2	0.2	10.9	18.9
30-34	34,120	82.0	6.4	1.1	6.8	2.4	0.3	10.5	20.3
35-39	37,227	82.8	6.1	1.1	6.7	1.9	0.4	10.0	20.8
40-44	40,909	82.5	7.6	1.5	5.4	1.6	0.4	8.3	21.9
45-49	43,849	82.1	6.6	2.4	5.4	1.4	0.8	8.9	21.5
50-54	44,607	81.9	6.0	2.3	5.3	1.6	1.4	9.8	21.4
55-60	38,593	69.1	7.3	4.4	6.9	2.0	7.4	19.2	20.2
Total	38,230	80.9	6.5	1.9	6.1	1.9	1.4	10.7	20.9

Source: Luxembourg Income Study, 1994, dataset for Canada, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

TABLE 10

Age and income in Germany

Age	Average gross income	Income sources (%)			Transfer sources (%)			Total	Income tax
		Labor	Business	Cash property	Social insurance	Means-tested	Pension		
25-29	31,747	87.7	1.7	0.3	4.9	3.7	0.0	10.3	13.4
30-34	39,949	85.8	7.1	0.9	4.0	1.4	0.0	6.2	15.0
35-39	45,944	81.3	10.0	2.3	4.6	1.3	0.0	6.5	15.2
40-44	48,523	78.7	12.0	2.7	4.3	1.7	0.0	6.6	16.0
45-49	53,947	79.4	11.6	3.1	3.4	1.9	0.1	5.9	18.5
50-54	62,911	82.7	5.2	7.0	3.3	1.0	0.6	5.2	23.7
55-60	45,906	81.4	3.4	3.7	8.9	0.9	1.2	11.4	16.3
Total	46,092	82.2	7.5	3.0	4.8	1.6	0.3	7.3	17.0

Source: Luxembourg Income Study, 1994, dataset for Germany, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

TABLE 11								
Age and income in Sweden								
Age	Average gross income	Income sources (%)			Transfer sources (%)			Income tax
		Labor	Business	Cash property	Social insurance ^a	Means-tested	Total ^b	
25–29	38,037	71.2	1.2	2.4	19.8	4.8	25.2	23.2
30–34	44,806	71.5	1.6	2.6	19.3	3.7	24.3	22.6
35–39	51,529	72.9	2.3	3.4	17.0	3.1	21.4	23.6
40–44	54,982	75.9	2.4	3.8	14.9	2.1	17.9	24.8
45–49	58,375	80.2	2.8	3.8	11.2	1.4	13.2	26.7
50–54	56,943	79.9	2.9	4.1	12.1	0.8	13.1	27.6
55–60	51,329	70.3	2.8	4.8	21.5	0.6	22.2	28.1
Total	50,519	74.9	2.3	3.6	16.2	2.3	19.2	25.3

^aSocial insurance transfers include public pensions.
^bTotal, excluding private pensions.
Source: Luxembourg Income Study, 1992, dataset for Sweden, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

TABLE 12									
Age and income in Finland									
Age	Average gross income	Income sources (%)			Transfer sources (%)				Income tax
		Labor	Business	Cash property	Social insurance	Means-tested	Pension	Total	
25–29	31,143	69.1	5.9	0.9	13.0	7.8	1.5	24.2	20.0
30–34	41,433	69.4	7.6	3.1	13.3	3.9	1.3	19.9	22.2
35–39	45,726	70.8	8.7	1.3	12.9	3.6	1.6	19.2	22.5
40–44	47,620	70.9	9.6	2.0	11.4	3.0	2.3	17.5	23.6
45–49	49,212	71.4	7.4	4.5	9.5	2.9	3.6	16.6	24.4
50–54	48,934	69.7	9.2	3.3	7.4	2.5	7.3	17.9	25.5
55–60	40,296	49.7	10.5	4.0	12.8	2.5	20.0	35.8	23.9
Total	43,851	68.0	8.5	2.8	11.3	3.5	5.0	20.7	23.4

Source: Luxembourg Income Study, 1995, dataset for Finland, Differdange, Luxembourg: Centre for Population, Poverty, and Policy Studies.

groups. In particular, if we compare the 55 to 60 age group, the fraction of gross income coming from pensions is 1 percent in Germany, 6 percent in the U.S., 7 percent in Canada, and a large 20 percent in Finland. Social insurance, which includes social security transfers, for the same age group represents respectively, 9 percent of gross income in Germany, 4 percent in the U.S., 7 percent in Canada, and 13 percent in Finland. Correspondingly, German families whose head is 55 to 60 are the ones with the highest fraction of gross income coming from labor: 81 percent, compared with a low of 50 percent in Finland. These numbers reflect the fact that the German system provides less incentive toward early retirement than in the other countries. At the opposite extreme is the Finnish system. In Finland, the fraction of gross income due to labor drops from 70 percent at age 50

to 50 percent for age 55 to 60. However, the fraction of income deriving from self-employment activities is higher than in the other countries and is even higher for older family heads. This indicates that in Finland people retire early and devote part of their time to self-employment.

As we discussed earlier, Sweden and Finland are the countries with the most generous transfer systems and highest average tax rates. We do not have data for private pensions in Sweden, and public pensions are included in social insurance. Looking at social insurance transfers, we see that their fraction of gross income increases from 12 percent at age 50 to 21 percent at age 55 to 60, while labor income decreases from 80 percent to 70 percent. In Sweden income from self-employment increases with age, flattening out at 2.8 percent around age 45 to 49 and

staying at that level. The available information for Sweden suggests that there are some incentives to retire early and that households do not supplement their income through self-employment to the same extent as our data suggest for Finland.

The U.S. and Canada seem to provide more incentives to retire early than Germany, but much less than Finland and Sweden. In both the U.S. and Canada, the transfer component that increases the most for the lowest or oldest income group is the pension component. The effect is somewhat stronger in Canada than in the U.S.

Conclusion

All of the various measures of income we look at are unequally distributed across countries, and their distributions are concentrated and skewed. The governments of these five countries have some commitment to reducing income inequality. However, they go about this task with different intensities and they use rather different tools to achieve it. The data for the U.S. indicate less commitment to reducing income inequality and a strong emphasis on progressive taxation as a redistribution device. Moreover, a large portion of the transfers to the poorest segment of the population are means tested.

Canada is quite close to the U.S., both in terms of size of redistribution and instruments used, with only slightly more emphasis on transfers.

Germany appears to focus on reducing labor income inequality through other policies, with less emphasis on taxes and transfers.

Sweden and Finland engage in substantial redistribution of income, using high average tax rates, little tax progressivity, and aggressive transfers. Sweden uses mainly social insurance transfers, while Finland relies a little more on means-tested transfers, but not nearly as much as the U.S. and Canada.

Our results provide some useful lessons for public policy. First, as we discussed in the introduction, economic theory suggests that there is a tradeoff between redistribution and efficiency: Transferring more income to the poorer people tends to reduce their work effort during their working years and may induce them to retire early. In addition, it can distort the economic decisions of those who are taxed to provide the revenues that are being redistributed.

Second, there are theoretical reasons why the distribution of labor income should depend on the tax and transfer system, as well as on the distribution of human capital. Human capital is linked to education, which in turn is influenced by government subsidies.

Our research provides evidence that is consistent with these theoretical propositions. It is interesting to notice that, as a result of all of these forces, the distribution of labor earnings in the countries that traditionally are more concerned with redistribution (Finland and Sweden) are not necessarily more equal than the ones that belong to the Anglo-Saxon tradition of low government intervention (the U.S. and, perhaps, Canada). Finland is one obvious example of a country of high government intervention and high labor income inequality. This is partly due to a more pronounced pattern of early retirement in Finland than in all of the other countries. Furthermore, Finland's relatively generous unemployment benefits may discourage job search and work effort. This could translate into a larger number of unemployed or underemployed, which increases measured inequality in labor earnings.

Our findings are thus consistent with the prediction from economic theory that greater redistribution through taxes and transfers is achieved at the cost of greater distortions on labor supply and early retirement decisions.

Consistent with other theoretical work, we also find that high redistribution countries rely heavily on instruments other than income taxes, such as transfers based on special conditions or means testing, to achieve high levels of redistribution while keeping distortions as low as possible for the beneficiaries. This is costly because it generates the need to monitor eligibility.

In Germany the level of redistribution through taxes and transfers is low. However, the distribution of labor earnings is remarkably more equal than in all of the other countries we consider. Evidently, the German government is using other instruments to achieve this, possibly more equal access to public education. Another factor may be the presence of powerful labor unions, which typically support a flat wage structure that enhances security at the expense of incentives.

APPENDIX

The data

Because of either underreporting or lack of oversampling of the rich, the people at the upper tail of the

earnings distribution are underrepresented in our datasets. Income from self-employment and income from interests and dividends are especially subject to underreporting.

For Germany and Finland, the original datasets did not allow the reporting of negative earnings, and set them to zero. To make our data more homogeneous across countries, we set negative earnings to zero also for the other countries.

The U.S. dataset

The sampling frame for the survey consists of all occupied housing units. The sampling frame is a multistage stratified probability sample of the population. Of the households participating in the survey in 1979, 8 percent to 9 percent refused to answer any of the income questions. If these cases are combined with others for which responses to some but not all income questions occurred, the “item” nonresponse rate for income amounts averages about 15 percent. Higher rates of missing responses were found for self-employment income (33 percent) and property income (25 percent). Imputation procedures were used by the CPS to replace the nonresponse to the question with an answer that was typical of other households with similar characteristics. This imputation procedure partly corrects for the bias due to the fact that nonrespondents have, on average, higher levels of income than respondents.

The CPS also compared the aggregates derived from the CPS dataset and the ones from the national income account, and adjustments were made. Even after the adjustments, property income (interest, dividends, rent) and means-tested transfer income data are of poor quality. Moreover, due to general non-sampling errors at the upper tail of the income distribution, very rich people are not well represented. The number of observations for households whose head is of working age (25–60) in the 1994 wave that we use is 41,871.

The Canadian dataset

The sampling frame includes all private dwellings in the ten Canadian provinces. A stratified cluster probability sample design was employed. In the 1987 *Survey of Consumer Finances* (SCF), 20 percent of individuals did not respond to income questions. The missing values were imputed. Some specific income items (for example, investment income sources and

some government transfers) were undercovered. The top end of the income distribution curve was under-represented in the sample. In the dataset that LIS derived from the 1994 wave of the Canadian SCF, there are 26,280 households whose head is of working age.

The German dataset

The sampling frame was given by the list of registered voters. The *German Socio-Economic Panel* employs a two-stage stratified sample design. Adjustments and corrections to the original dataset were made to improve data quality. However, the dataset still suffers from a relatively high number of missing values. To get around this problem, we dropped the households for which we did not have the information on either earnings, income or disposable income (about 8 percent of our sample). In the dataset that LIS derived from the 1994 wave for Germany there are 4,224 households whose head is of working age.

The Swedish dataset

The sampling frame for the *Income Distribution Survey* is the taxation register for all individuals 18 years of age and older. A four-stage stratified sample design was used. The sample design was used to control the sample size for farmers, employers, and pensioners. Evaluations of the quality of these income data were not performed and no corrections or adjustments were made to the original data. However, since the data come from the taxation register, there are no missing data for income. In the dataset that LIS derived from this source, there are 8,720 households whose head is of working age.

The Finnish dataset

The sampling frame for the Finnish *Income Distribution Survey* is the taxation register for the total population of household heads. As in the Swedish dataset, there are no missing data for income. Some population groups have been oversampled, such as farmers, other entrepreneurs, and other high-income groups. This is corrected through the weighting procedure. In the dataset derived by LIS from the 1995 wave there are data on 7,033 households.

NOTES

¹Stokey (1999) provides an overview of the literature on intergenerational mobility in the U.S. She concludes that even in the country considered the “land of equal opportunity,” children from rich families have more chances for economic success than children from poor families.

²See Heckman, Lochner, and Taber (1998) for a theoretical model estimated on the U.S. data, in which many of these elements interact dynamically.

³See, for example, Cremer and Pestieau (1996).

⁴Salary income includes all forms of cash wage and salary income, including employer bonuses, gross of employee social insurance contributions/taxes but net of employer contributions/taxes.

⁵Typically, α is chosen to be between 0 and 1. When $\alpha = 0$ we get back to the benchmark case we discuss throughout the article:

Total family income is the unit of analysis. Should one choose $\alpha = 1$, the unit of analysis would be per capita family income. To check our results against the case $\alpha = 0$, we choose $\alpha = .5$, which is a number commonly used in the literature.

⁶Díaz-Giménez, Quadrini, and Ríos-Rull (1997) and Quadrini (1997) report the same finding for the U.S. economy using the *Panel Study of Income Dynamics* and the *Survey of Consumer Finance* datasets.

⁷At first, this might seem surprising because in most countries the distribution of wealth is very concentrated. In the U.S., the top 5 percent of people hold 50 percent of the total wealth, while the bottom 40 percent of people hold only 4 percent of total wealth (Wolff, 1987). As a result, income from capital is also highly concentrated. Moreover, one could expect a high correlation between wealth and earnings. Díaz-Giménez, Quadrini, and Ríos-Rull (1997) find a small correlation (.23) between earnings and wealth, but include retirees in their sample. The correlation between earnings and wealth should be higher in our subsample. However, LIS does not provide data on assets so we cannot compute it.

⁸As we discussed above, cash property income is more concentrated than earnings because the distribution of wealth itself is. This implies that when we add cash property income to earnings, this increases the fraction of total factor income held by the richest people. This would increase the Gini coefficient. However, adding cash property income also reduces the fraction of people at zero or negative wealth, thereby reducing the Gini index. In our dataset, the two forces counterbalance each other in each country so that the Gini coefficients for earnings and factor income in every country are basically the same. The fact that the Gini coefficient is unchanged is likely to be a con-

sequence of the underreporting of interest and dividend income and of the underrepresentation of the very rich people.

⁹We could choose different cutoffs for the comparisons, for example, the richest 10 percent with the poorest 10 percent. We choose to look at the poorest 20 percent because this is the smallest fraction of people that have positive earnings in all of the countries we consider.

¹⁰See Crawford and Lilien (1981) for a theoretical paper on how social security influences retirement decisions.

¹¹We do not report the Lorenz curves for factor income across the various countries because they overlap almost perfectly with the ones for earnings and the patterns are similar to those described above. This is probably a consequence of the fact that we do not have good data on interests and dividends.

¹²Each quartile includes 25 percent of the households in our sample, including all working age families, ordered from poorest to richest.

¹³We do not report the information on factor income separately because in this sample its distribution is very close to the one for earnings, as we noted previously.

¹⁴Examples of near-cash benefits are food stamps and housing benefits.

¹⁵In the dataset for Sweden, public pensions are lumped together with social security transfers and we have no data for private pensions. As a result, our computation underestimates total transfers in Sweden.

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