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Social Transfers and Income Inequality in Old-age: A Multi-national Perspective

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Social Transfers and Income Inequality in Old-age: A Multi-national Perspective

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Abstract

This paper examines variation in old-age income inequality between industrialized nations with modern welfare systems. The analysis of income inequality across countries with different retirement income systems provides a perspective on public pension policy choices and designs and their distributional implications. Because of the progressive nature of public pension programs, we hypothesize that there is an inverse relationship between the quality of public pension benefits and old-age income inequality -- that is, countries with comprehensive, universal, and generous public pension systems will exhibit more equal distributions of income in old age.

Luxembourg Income Study data indeed show that cross-national variation in old-age income inequality is partly explained by differences in the percentage of seniors' total income derived from public pension transfers. Sweden, for example, has the highest the level of government transfers and the lowest level of old-age income inequality, while Israel and the U.S. have the lowest levels of dependency on government transfers and the highest levels of income inequality. A notable exception is Canada where public transfers represent only a moderate portion of elderly income, yet old-age income inequality is relatively low. This suggests that other factors besides quality of public pension benefits play a role in differences in old-age income inequality across countries.

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Introduction

The North American Actuarial Journal has published several papers in recent issues dealing with the issue of "Adequacy, Equity and Progressiveness" in Social Security systems. The most recent of these papers was entitled: "Social Security—Adequacy, Equity and Progressiveness: A review of Criteria Based on Experience in Canada and the United States" (Brown and Ip, 2000). That paper in turn referred to an earlier one by Knox and Cornish (1997) who established four criteria for a national retirement income system:

1. An adequate minimum income should be provided for all retirees.
2. Outputs should be related to inputs (that is, more contribution should lead to more benefits).
3. Redistribution should be progressive.
4. Similar benefits should be provided to individuals in similar circumstances.

Clearly, adequacy is satisfied by the first criterion, equity by the second criterion and progressiveness by the third. The fourth criterion has more to do with refinements in plan design and will not be discussed further here.

In reviewing the four 'Knox-Cornish' criteria, Brown and Ip concluded that the social security systems in both Canada and the United States met all of the criteria. At the same time, Brown and Ip commented that Canada placed greater emphasis on adequacy while the United States gave more weight to individual equity.

This paper reviews the social security systems of ten nations, including Canada and the United States. All of these systems exist in modern, western developed nations. The tests applied to the systems give us feedback on two characteristics of these systems: their emphasis on adequacy versus equity and the control of the retirement system of the country analyzed that is held by the central government.

Specifically, income inequalities in old age are significantly shaped by retirement income policies. Countries differ in quality of public pension benefits and in the mixture and composition of public and private sources of retirement income. It has been argued that countries with high quality public benefits (defined as comprehensive and generous) will have low levels of income inequality (Myles, 1989). That is, countries with high levels of public pension benefits will likely improve the relative income status of those who were poor during the working years, producing more equal distributions of income in old age. On the other hand, countries with more private, market-oriented old-age welfare systems, such as Canada, the U.S., and the U.K., which place emphasis on private retirement savings/pensions and income-tested social assistance, tend to maintain, and even strengthen, the position of those with pre-retirement income disadvantages (Esping-Andersen, 1990). Hence, while these private welfare schemes are designed to provide seniors in these countries with the majority of their pre-retirement earnings, they tend to provide relatively less for lower-income workers because they are largely the preserve of advantaged persons (e.g., those with higher income), producing even more highly skewed distributions of income in retirement than in the working years.

The goal of this paper is to analyze income inequality across countries with differing retirement income systems to determine the equalizing effect of public pensions on income distribution. Looking at the anti-poverty effectiveness of income maintenance systems for the aged, Smeeding (2001) found that countries with higher levels of spending on income maintenance and adequate minimum income security benefits in old age had lower rates of old-age poverty. We hypothesize that the relative magnitude of old-age income inequality within a country is also related to its public income security policy in the form of transfer programs. That is, there is a positive relationship between old-age income equality and the proportion of seniors' total income from public pensions (i.e., government/social transfers). Support for this hypothesis suggests that the more equal income is after retirement, the more the system favors adequacy while the less equal post-retirement income on a macro-economic basis is, the more emphasis that is given to equity (that is, we would expect a continuation of pre-retirement income inequality to a greater extent). It is important to note that while claims of causality cannot be made from support of this hypothesis, cross-national comparisons do provide a perspective on public policies within a country and their implications for old-age income equality/inequality.

Research Methods

Data The Luxembourg Income Study (LIS) is used as the basis of analysis. LIS data are a compilation of income survey data files that have been made comparable by rearranging/reclassifying income measures (Smeeding, 1991). The LIS aggregates (or disaggregates) country-specific income elements into internationally consistent income categories such as occupational-pension benefits and social-transfer benefits.

The LIS includes 29 countries, but our analysis focuses on industrialized nations with modern welfare systems using the most recent complete wave of LIS data (Wave IV -- around 1996). These countries include: Australia, Canada, Denmark, Germany, Israel, Netherlands, Norway, Sweden, United Kingdom, and United States. While the LIS has been designed to make cross-national comparisons possible, some differences between LIS datasets make it difficult to compare all countries. Specifically, France and Belgium commingle occupational pensions with social transfers in the LIS datasets. Conversely, Finland includes government-funded pension data in the occupational pension category. Since these countries are not strictly comparable, they are excluded from the analysis. Austria, Ireland, and Italy are also excluded because of missing information (e.g., gross income data are not available).

Measuring Income International comparisons of economic performance are almost always made in terms of money income. Datasets, such as the LIS, also focus on annual cash income. Further, many income surveys and the LIS permit analyses at the individual and household levels. In income distribution studies, the main issue of concern is the welfare of the individual. Personal income, however, is not the most suitable measure of economic well-being because some individuals in the population show no or little income, yet have a relatively high standard of living. This study considers a broader

measure of economic well-being; that is, the "pooled" annual money income of elderly-headed (65+) households. Specifically, annual money income is total income received from all household members from all sources, both private sources -- earnings, investments (namely interest on bank accounts and bonds, dividend income, capital gains, rent income), and occupational pensions/annuities -- and public sources (what we call social or government transfers, namely social security retirement benefits and means-tested old-age benefits).

When using household income as the income measure, however, adjustments must be made for household size. A common approach in controlling for household size is to produce household income on a per capita basis. This method, however, overcorrects for household size (i.e., underestimates household resources) because it does not take into consideration the "economies of scale" in multi-person households. Based on a comprehensive analysis of equivalence scales, Rainwater (1974) finds that total household income divided by an equivalence elasticity of .5 (specifically, household size raised to the power of .5, or the square root of household size) provides a superior method of adjusting household income for household size. This approach offers an intermediate statistic between using no adjustment and using per capita income. Consistent with many OECD, LIS, and U.S. income distribution studies, this paper uses this equivalence scale. Hence, the denominator of adjusted household income equals 1.0 for a one-person household, 1.41 for a two-person household, 1.73 for a three-person household, and so on. This means that a household of two, for example, needs 1.41 times the income of a one-person household to be comparably well off. Further, we assign the household's equivalent income to each member of the household to get back to the individual level of analysis. All analyses are also performed using the sample weights provided in each LIS dataset.

Measuring Income Inequality Income can be measured at either the relative (a household’s share of total income) or absolute (actual dollar amount received by a household) level. Absolute income inequalities are the dollar distances between households who fall at different points in the income distribution, and relative income inequalities refer to the share of the income pie allocated to different households at different points in the income distribution. International comparisons of economic performance are almost always made in terms of relative income. Since most countries have their own currencies, cash income cannot be compared directly. While currencies can be made somewhat comparable by converting them into a common one (usually the U.S. dollar) or by using, for example, the Purchasing Power Parity, most measures of income inequality, such as the Gini ratio and income quintiles, are based on proportions and not levels of income (i.e., they measure relative income inequality). In the end, while measures of relative income inequality disregard differences in average real income between countries, they allow direct international comparisons of within-country income distributions.

The Gini ratio has become one of the most commonly used and recognized summary measures of relative income inequality, and is used here. It is a summary device that provides a single number measure of relative inequality. The Gini ratio ranges from zero to one. If everyone had the same income, the Gini ratio would be zero; conversely, if

just one individual held all income, the coefficient would be one. For that reason, the higher the Gini ratio, the more inequality that exists. We also display income quintile distributions, where the first quintile is comprised of those with the lowest 20% of incomes….. and the fifth quintile represents those with the highest 20% of incomes.

Results

Income Inequality in an International Context Our hypothesis states that the relative magnitude of old-age income inequality within a country is directly related to its public income security policy in the form of social transfer programs. We begin our analysis by looking at the distribution of adjusted net household income for household heads aged 65+.

Income distribution differences across countries occur primarily in the top and bottom quintiles. Looking at Table 1, Sweden and Denmark have the largest bottom quintile – 12.5% and 12.3% - but just slightly higher than the bottom quintile share in Norway and Canada. However, since the second bottom quintile in both Sweden and Denmark also receive a relatively higher income share, they have the lowest income share in the top quintile. This more equal distribution of income is reflected in Sweden and Denmark's moderately low Gini coefficient (.194 and .214, respectively) compared to Germany (.244), Norway (.253), and Canada (.256). By contrast, Israel and the U.S. have the lowest income share in the bottom quintile compared to the other countries, and the highest percentage in the top quintile. This is reflected in their relatively high Ginis (.374 and .364, respectively). The levels of old-age income inequality in Australia (.320) and the Netherlands (.317) are also relatively high, followed by the U.K. (.292).

Table 1: Adjusted[a] Household Income Distribution by Quintiles and Gini Coefficients, for Selected Countries, Household Heads Aged 65+.

	Country									
	Australia	**Canada**	**Denmark**	**Germany**	**Israel**	**Netherlands**	**Norway**	**Sweden**	**U.K.**	**U.S.**
Q1	7.0	10.8	12.3	10.3	6.4	6.9	10.9	12.5	10.1	6.4
Q2	13.4	13.8	15.2	15.0	10.8	14.5	14.1	16.1	13.0	11.5
Q3	17.0	17.0	17.5	17.9	15.7	17.6	17.3	18.4	16.2	16.2
Q4	23.2	22.2	21.1	22.2	23.3	23.4	21.9	21.4	21.7	22.9
Q5	39.4	36.4	33.9	34.6	43.9	37.5	35.7	31.7	39.1	43.0
Gini	.320	.256	.214	.244	.374	.317	.253	.194	.292	.364

a. Quintiles and Gini coefficients are based on after-tax household income adjusted for household size.

Source: Luxembourg Income Study, Household files, Wave IV.

To shed light on these findings, Table 2 shows the composition of seniors' household gross incomes by source. Generally speaking, private income components (i.e., earnings, investments, and occupational pensions) constitute a smaller share of total household income in countries with low levels of income inequality. Sweden, the Netherlands, and Denmark have the lowest dependency on earnings. By contrast, earnings are very important in Israel, Australia, and the U.S. -- around 30% of the total income of elderly-headed households comes from this source. Norway, Canada, the U.K., and Germany fall in between, receiving about 15-20% from earnings.

Investment income is also a key source of income for elderly households in countries with high levels of income inequality, namely in Australia and the U.S. -- households headed by seniors receive around 16% of income from this source. As a proportion of household income, investments are far less important in Germany, Sweden, and Denmark – less than 9%. Investments make-up about 9-14% of seniors' total household income in the Netherlands, Israel, Norway, Canada, and the U.K. On the other hand, the link between private pension income and income inequality is less consistent.

Table 2: Percentage Distribution of Adjusted [a] Household Income by Sources, for Selected Countries, Household Heads Aged 65+.

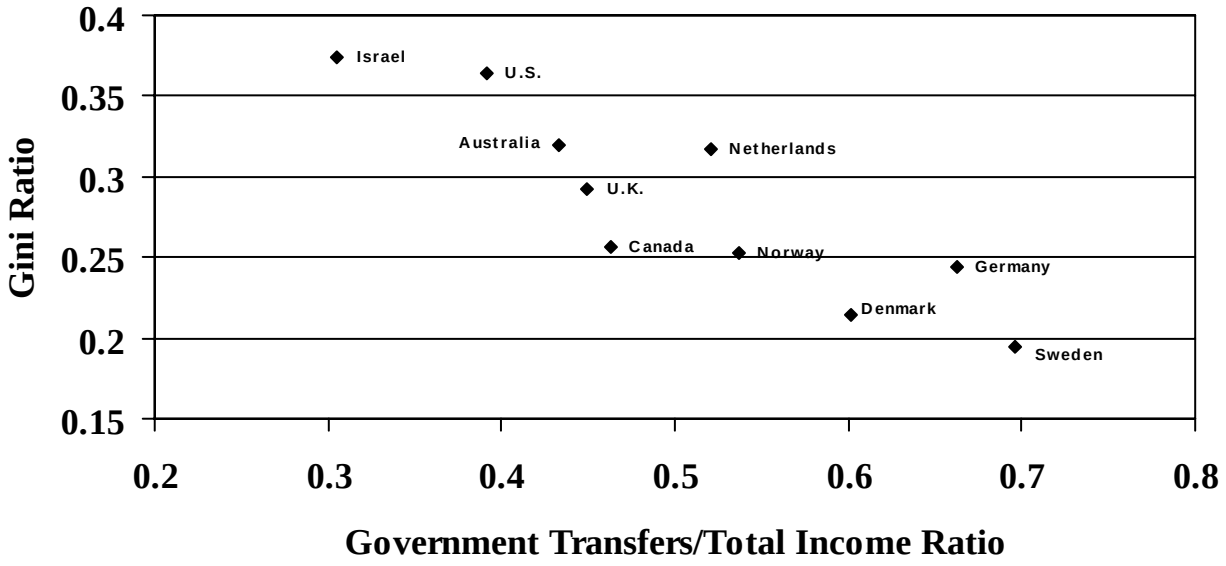
	Country									
	Australia	**Canada**	**Denmark**	**Germany**	**Israel**	**Netherlands**	**Norway**	**Sweden**	**U.K.**	**U.S.**
Source										
Earnings [b]	29.3	19.6	11.0	14.9	32.8	8.6	20.9	7.2	15.9	28.2
Investments [c]	16.8	14.0	8.7	4.9	9.5	9.4	10.1	7.2	14.1	15.8
Pensions [d]	10.7	20.0	20.1	13.9	27.2	29.9	15.3	16.0	25.1	17.0
Gov.Tranfers	43.3	46.3	60.2	66.3	30.5	52.1	53.7	69.6	44.9	39.1

a. Percentages are based on before-tax household income adjusted for household size, and may not total exactly to 100% due to rounding.
b. Includes self-employment income.
c. Includes other income from private sources.
d. Private (occupational) pension income.

Source: Luxembourg Income Study, Household files, Wave IV.

Public Pensions and Income Distribution Given the positive relationship between the importance of private income and the level of income inequality, it is not surprising that countries with high levels of public-pension support have relatively low levels of income inequality. Specifically, Figure 1, which cross-tabulates data from Tables 1 and 2, clearly shows support for our hypothesis -- the higher the relative level of government transfers, the lower the overall extent of old-age income inequality (r-square: 0.79).

Figure 1 Percentage of Household Income from Government Transfers by Gini Coefficient, for Selected Countries, Household Heads Aged 65+.



Source: Luxembourg Income Study, Household files, Wave IV.

Aggregate government transfers range from about 31% and 39% of gross total household income of the 65+ population in Israel and the U.S. to about 60% in Denmark, 66% in Germany, and 70% in Sweden, the countries with the highest and lowest Gini coefficients respectively (e.g., for every $100 of income received by U.S. elderly-headed households, just $39.10 comes from government systems). In all other countries, public transfers account for about one-half of the aged's total household income. These data suggest that cross-national variations in income inequality are partly explained by differences in the percentage of public pension transfers in the composition of household income.

However, it is not a perfect relationship. It is important to point out that transfers represent a much higher portion of elderly household income in Germany than they do Canada, while incomes in Canada are just as equally distributed. Relatedly, Canada on a per capita basis spends roughly the same on transfers as does the U.K. and Australia, yet has a much lower level of overall income inequality. While quality of public pension benefits play a key role in differences in old-age income inequality across countries, these findings suggest that other factors are also important in accounting for these differences, and need to be explored in future research. We would suggest that the RRSP (Registered Retirement Savings Plans), RPP (Registered Pension Plans), and tax systems in Canada would have to be a part of the explanation.

Conclusion

This paper has added to the discussion of the two important attributes of any social security system, namely: equity and adequacy. The analysis has shown that there is a strong positive correlation between the level of income transfers provided by the government-sponsored social security and means-tested welfare benefits and the income equality experienced by those age 65 and over.

However, perhaps because the authors are Canadian, we find the position where Canada lies in the distributions to be particularly interesting. Canada provides its citizens with income equality post-65 that is only somewhat less than that provided in Sweden and Denmark, but does that in a manner that requires government intervention that is only slightly larger than in the U.S., Australia, and the U.K.

We do not comment on the advocacy of these properties. That is, is post-retirement income equality a positive national goal? However, we would opine that most actuaries in North American would feel that achieving some measurable level of income security post-retirement with a minimum of government intervention is a laudable combination of features. For those who wish to explore the social security systems of Canada and the United States in greater detail, we refer you to Brown (1998).

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