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MEASURE?**

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Which Canadian Seniors Are Below the Low-Income Measure?

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Abstract: About 6% of seniors in Canada have family incomes below the Low-Income Measure. (The Low-Income Measure is 50% of the median family income, adjusted for family size, and is a commonly used, if arbitrary, operational definition of relative poverty.) This is a low rate by international standards, in sharp contrast to the high rate in Canada about 35 years ago. It is lower than the comparable rates for the general Canadian population or for families with children and more Canadians leave below-LIM status during their retirement years than enter it. Canadian income tax data show that the remaining 6% are disproportionately immigrant, female, currently unmarried and supporting dependent children (possibly grandchildren). Age does not appear to be of great importance.

Keywords: relative poverty, Canadian income distribution, pension adequacy

JEL Codes: D31, E24 , J14

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INTRODUCTION

A common empirical measure of a nation's poverty line is the Low Income Measure (LIM), which is 50% of the median household income (after tax and transfers) adjusted for family size. Hence one measure of poverty is the percentage of families with family-size-adjusted income below LIM. Canada's current senior below-LIM rate has fallen from over 35% in the early seventies to about 6%. Elsewhere in this volume, Milligan (2007) concentrates on that change over time. This article addresses the question: Who are the remaining 6%?

CONTEXT

One way to put the question in context is to compare Canada's situation internationally. The Luxemburg Income Study (LIS) tables, probably the best-known international comparisons, use a LIM measure where the adjustment for household size is dividing by the square root of the number of members of the family. Table 1, drawn directly from LIS tables, gives a number of below-LIM rates for selected countries over roughly the last 35 years. All below-LIM rates are calculated using 50% of the median income for *all* households, not on the median incomes for the subgroups.

Table 1 shows that the below-LIM rate of seniors (defined as those over age 65) in Canada has fallen dramatically over the last 35 years, from some 37 per cent in the early 1970s to about 6 per cent in the year 2000. The comparable values for different countries are in boldface for convenience: for no other country in the LIS do the data show a reduction even remotely close to that for Canada. Moreover the current value of 6 per cent is a low value by international standards: in Table 1, only the Netherlands has a

lower value (as do Hungary, Luxemburg and Poland, countries in the LIS but not in Table 1). But the other 26 countries in the LIS have higher senior below-LIM rates, sometimes slightly higher (e.g. Sweden and Germany) but often much higher (Australia, the United Kingdom and the United States). The U.S. senior below-LIM rate is four times that of Canada's. The reduction in Canadian senior poverty has been discussed in a number of articles: see Myles (2000), Osberg (2001) and more recently Milligan (2007).

Nonetheless, the below-LIM rates should only be interpreted as poverty rates with extreme caution. First, there are a number of shortcomings with use of current income as the basis of a poverty measure; some of these will be discussed in more detail later. A second, related problem is that the below-LIM rate will not satisfy those who desire a measure of absolute poverty (an inability to provide the necessities of life, such as adequate nutrition and shelter) as it is rather a measure of *relative* poverty (poverty relative to a normal standard of living as proxied by median income). Third, the below-LIM rate is a pure count, so that it makes no allowance for the average distance below LIM of those counted (the *depth* of poverty) or for the average distance above LIM for those not counted (the *height* of prosperity). Finally, the use of 50% of median income, as opposed to some other percentage, is arbitrary.

The last point is well illustrated by Table 1. If the below-LIM rate is based on 40% of family income, the senior below-LIM rate in Canada falls to 1%. It climbs to 17% if a threshold of 60% is used. This is because Canadian income support programs for the older population (Old Age Security plus the Guaranteed Income Supplement or OAS/GIS) tend to push many senior family incomes just above the 50% threshold. However, the big decline in below-LIM rates over the past 35 years is evident, regardless

of which threshold is used. Changing the thresholds has different effects on the below-LIM rate levels for different countries. For example for Australia, the below-LIM rate falls strikingly when 40% is used, with the below-LIM (50%) rate at 23% but the below-LIM (40%) rate only 5%. However, the choice of threshold has typically little effect on the trends, with an exception being the United Kingdom, where the below-LIM (40%) rate is rising while the below-LIM (60%) rate is falling.

Comparing the below-LIM (50%) rate of 6% in the older population to below-LIM rates for other groups in Canada, the below-LIM rate for children (that is the number of children under 18 in below-LIM households as a percentage of all children under 18) has been close to 15% for some 30 years. The general population below-LIM rate has been stable for the most recent 20 years at about 11%. Turning internationally, the general rule within the LIS countries has been for fairly stable child and general population below-LIM rates. In Table 1, the Netherlands (with its exceptionally low senior below-LIM rate) is the only other country besides Canada with recent below-LIM rates higher for children and the general population than for seniors. (Though not reported in Table 1, this is also true for the LIS data for Hungary, Luxemburg and Poland.)

To summarize this section, while the choice of 50% as a threshold makes a difference in the level of the below-LIM rate, the overall reduction over the past 35 years in Canada is evident regardless of the threshold used. This size of this reduction is unique in the 31 countries in the Luxemburg Income Study. Canada is also one of a handful of countries where the below-LIM rates for families with children and the general population are higher than that for seniors. It would appear, that as compared to other

countries, Canadian policies to reduce senior poverty have been more successful or at least more extensive. This makes it particularly interesting to see who is still in the senior below-LIM group. For example if Canada wanted to attain the exceptionally low senior below-LIM rate of the Netherlands, who would be the senior individuals whose below-LIM status would need to change?

DATA

We will examine the question of which Canadian seniors have below-LIM status using the Statistics Canada Longitudinal Administrative Database (LAD), a 20% longitudinal, renewed sample of all Canadian taxfilers. For 2004, the year this study uses, there are over 4 million records. The data do not contain information from outside taxfiles (e.g. there is no direct education information) but do contain gender, family composition, and immigration status variables as well as data on income sources and various tax deductions. Seniors are defined for this study as aged 66 or over, because only age at time of filing is known, not date of birth, and this method ensures that those defined as seniors were over 65 for the entire year. Moreover, following Statistics Canada standard practice, the adjustment for family size is not the division by the square root of the number of family members as in the LIS reported data but rather division by the sum of one (for the first family member) plus $0.4 \times$ the number of remaining family members¹ aged 16 and over plus $0.3 \times$ the number of remaining family members under age 16.²

¹ Family throughout this paper refers to an economic family: a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law or adoption. A couple may be of opposite or same sex. Foster children are included. However in the LAD, families are one-generational: a couple living with three children and one of the couple's parents, say, would count as two families: one family of the two adult parents and their three children and one family of a single adult.

² If all children, if any, are under 16 and there are two parents, the Statistics Canada family size adjustment is smaller than the square root adjustment for families of three or less, the same for families of four and

Despite these slight differences in definition, and while this is not the same survey data used to calculate the values reported for Canada by the Luxemburg Income Study (the sources were the Survey of Consumer Finances for 1997 and before and the Survey of Labour and Income Dynamics for 1998 and 2000), the below-LIM rate calculated for 2004 for seniors is 5.9%, very close to the 6% value reported in Table 1 for Canada for both 1990 and 2000.³

WHO ARE THE 6%?

A related study by André Bernard and Chris Li (2006) of Statistics Canada also examines the seniors below-LIM rate using the LAD data, also using the 50% of median income threshold. It focuses on the impact of the death of a spouse. It finds that the below-LIM rate for widowers in the year of loss is about 1% but it climbs to about 4% five years later. For widows, the below-LIM rate is comparable in the year of loss but after five years it is 8%. These values are consistent with their estimates of transition rates from above-LIM status to below-LIM status. Bernard and Li find that the main reason for the difference both over time and between widows and widowers is the loss of private pensions and loss of employment earnings, although for both widows and widowers, death of a spouse brings an automatic reduction in OAS/GIS payments.

Therefore, following the Bernard and Li study, Table 2 explores the roles of gender, age and marital status. It can be seen that for both genders and for any marital

larger for families of five or more. If there are children in the home over 16, the Statistics Canada family size adjustment is always larger than the square root adjustment.

³ This closeness is a bit misleading because of the different years. The Survey of Labour and Income Dynamics estimate of the below-LIM rate is about one percentage point lower for 2004. Note that the LAD data source may catch some low income households that surveys may miss. See Frenette, Green and Picot (2004) and Frenette, Green and Milligan (forthcoming).

status, age is not a major determinant of below-LIM rates, with the significant exception of women 91 years of age and older, who have especially high below-LIM rates if they are widowed, separated and particularly if they are divorced. The differences associated with marital status are much more consistent. For men, in every age category, the below-LIM rate is consistently lowest to highest in this order: married, widowed, divorced, separated and never married. For women, the order is almost the same, except that separated and never married switch positions. The main message is clear: below-LIM rates are lowest for the married but are significantly higher for those who are unmarried.

The other main message from Table 2 is that below-LIM rates are significantly higher for unmarried women than they are for unmarried men. The differences are particularly large comparing widowers/widows, the divorced and the separated.

Turning to a different aspect, while the reduction in below-LIM rates in the last thirty-five years may be largely attributable to increases in government transfers to seniors, immigrants are not always eligible for such programs as OAS/GIS or may not have accumulated sufficient earnings years to benefit from the Canada Pension Plan (CPP) or its counterpart the Quebec Pension Plan (QPP).⁴ This is empirically very important: using the LAD, I calculate that for immigrants who landed from 1994 to 2003 and are 66 years of age or over, 71% had below-LIM status for 2004. While such immigrants constitute about 2% of that age group, they represent over 20% of those in that age group who are below LIM. Table 3 provides some information on the

⁴ Essentially, eligibility for at least partial OAS requires ten years residence in Canada and GIS eligibility requires at least partial OAS eligibility. CPP/QPP eligibility requires one year of residence, but payments will be small if work history is short.

composition of below-LIM senior immigrants: females and unmarrieds⁵ are more likely below-LIM while age does not seem that important. These results mirror those for the general senior case described above. The most important difference seems to be time of landing: more recent immigrants are much more likely to be below-LIM.

The results of Tables 2 and 3 are reinforced by those in Table 4, which presents the estimated odds ratios from a logit regression analysis for 2004 above-LIM status that incorporates both marital status and immigration status as independent variables along with the presence of dependent children under 18.⁶ Because of the longitudinal nature of the data, the logit equation can also control for above-LIM status ten years previously, in 1994.⁷ There are many shortcomings to this approach. One is attrition bias in that the sample can only include individuals who remained in the sample for ten years and did not exit because of death or emigration. A second is that 1994 Above-LIM status cannot be observed for the large majority of the immigrants in the sample who arrived after 1994. Accordingly in all cases where this value is not known for immigrants, the immigrant is treated as below-LIM which seems likely to be a reasonable approximation, given Table 3 and its implication that even though the economic status of most immigrants improves with duration of income, below-LIM status still predominates among immigrant seniors.

However the approach does allow us to examine further the factors identified as likely to be important from the earlier tables in a multivariate context. Above-LIM status is the dependent variable so that estimated odds ratios greater than one are associated

⁵ The number of immigrants is sufficiently small that marital status in this case was defined as either married or unmarried.

⁶ While there are a variety of possibilities for the presence of dependent children, if they are grandchildren living with their grandparents, the parents cannot be living in the same home. If a parent or parents were living in the same home, the LAD sample would count this as two families, one of the parent(s) and child(ren) and the other the grandparent or grandparents.

⁷ Very similar results are obtained when instead the control variable is the log of 1994 after-tax income (excluding zeroes or negative values).

with a greater probability of above-LIM status or prosperity and values below one are associated with a greater probability of below-LIM status or poverty. For both men and women, individuals with above-LIM status in 1994 are 6 times more likely to be above-LIM in 2004. Conditioning on other variables, immigrants are about one-tenth as likely to be above-LIM in 2004, with the probability smaller for women. Being a widow or a widower, divorced, separated or never married reduces the odds of being above-LIM, with the odds much more adverse for women. For example, conditioning on the other variables, senior never-married women have only one-tenth the chance of being above-LIM as senior married women. And the presence of dependent children also is associated with substantially reduced odds of being above-LIM, with the odds about five times lower for men and seven times lower for women.⁸ While the size of this difference may be surprising, the direction is not, for the presence of children will increase the amount of household income required to be above-LIM, for example by 40% in the case of a never-married senior adult with one child as compared to a never-married senior adult alone.

To close this discussion, let us return to some of the shortcomings of the exercise itself. One problem noted is that the below-LIM rate is a measure of (relative) income poverty. Some below-LIM seniors may have high enough levels of wealth to maintain a standard of living that is above poverty. Table 5 presents some comparisons between all 66+ seniors and those below-LIM which, while far from definitive, suggest that the focus on income may not be distorting the picture very much. For example compared to the general population of seniors, below-LIM seniors do not appear to have significant capital gains income and have much less rental income suggesting less ownership of

⁸ The unconditional values are that about 0.9% of all 66+ seniors have dependent children under 18 in their economic family compared to about 3.1% for below-LIM 66+ seniors.

financial and real estate wealth. They are only slightly more likely to have gross farm or fishing income (potentially indicative of owning a farm or fishing boat). One of the few measures of “spending” in the income tax data is charitable spending and the rate of charitable contributions in excess of \$500 is very low for the below-LIM population, consistent with low stocks of wealth.⁹ They are significantly more likely to have a self-employment loss (which could be a transitory income shock), but this is relevant for only a small percentage of the below-LIM population.

Table 5 also provides information on transitions, where the sample is restricted to those aged 66 to 70 in 2004, in part to reduce attrition bias and in part so the transitions are more interpretable (so that for example the 1994 to 2004 transition will capture “the retirement years” for most individuals). It can be seen that previous below-LIM status is a strong but not overarching predictor of 2004 below-LIM status: approximately 40% of those below-LIM were not below-LIM in the previous year observed, be that 1994, 1999 or 2003. Also note that while the 2004 below-LIM rate is about 4 per cent for this age group, the below-LIM rate for the same individuals in 1999 and 1994 was more than twice as great, suggesting that at retirement more individuals leave below-LIM status than fall to it.

In passing we note two other empirical comparisons. The only indication of aboriginal status in the LAD data is receipt of Indian exempt employment income and that is only available for 1999 to 2004. Hence we restrict our sample of seniors to those who were 66 to 70 in 2004, as older seniors were unlikely to earn such income during the 1999 to 2004 period. While in this age group very few individuals (just 0.2% of the

⁹ For many purposes, consumption inequality is more revealing than income inequality. See Crossley and Pendakur (2006) and Pendakur (2001). However the LAD, based as it is on income tax data, does not have good measures of consumption.

general population) receive such income, it is three times more prevalent (0.6%) in the below-LIM population providing suggestive evidence that aboriginals may be disproportionately represented in the below-LIM group. A factor of greater aggregate significance is nonreceipt of OAS among the nonimmigrant population. For those who did not immigrate 1994 or later, it is possible not to qualify for OAS if residence in Canada was not maintained in this period. Another possibility for OAS non-receipt is if the individual chooses not to apply or applies for discontinuance: this is not surprising for those who receive enough income that the OAS would be clawed back anyway but that explanation cannot apply to those below-LIM who would not have received enough income for the clawback to apply. It is striking that almost 9 per cent of the below-LIM population compared to only one per cent of the general population is not in receipt of OAS benefits, suggesting that even for non-immigrants ineligibility or none take-up of benefits has some importance in the below-LIM rate.

Perhaps the most obvious example of the incompleteness of income as an indicator of standard of living is the difference between those who own their own home and those who don't (where unfortunately home ownership cannot be determined by the LAD). The potential consequences of this can be evaluated using a much smaller data set, the Survey of Labour and Income Dynamics (SLID), which provides this information.¹⁰ Using the SLID for 2004, the below-LIM rates for currently unmarried (66+) seniors were about 7.6% and 13.4% for those owning and not owning residences respectively. For senior couples, the corresponding rates were 0.7% and 3.6%, for those owning and not owning a residence respectively. Hence groups without home ownership have higher

¹⁰ The Survey of Labour and Income Dynamics samples about 15,000 households in each survey year. I thank Simo Goshev for making the calculations from the SLID.

rather than lower below-LIM rates. It would appear that including imputed income from home ownership in the measure would likely increase the below-LIM estimate of relative poverty rather than lower it.

Finally, the LAD does not indicate which seniors are living with younger adults, for example their adult children. (Such seniors would be included as their own, separate economic families.) Again using the SLID, if families are constructed for seniors (66 years or over) living with younger adults (18 years or over), their below-LIM rate is 3.5% while those not living with younger adults have a below-LIM rate of 4.8%. Hence it is likely that the below-LIM rate from the LAD is somewhat higher than a below-LIM rate in which seniors who live with younger adults are counted as members of these larger economic families.

SUMMARY AND CONCLUSIONS

Let us summarize and augment our calculations by considering 1000 people over the age of 65 resident in Canada in 2004. According to the Longitudinal Administrative Database for that year, an expected 59 will be in economic families with insufficient income to attain the low-income measure, with age not appearing to be of strong importance. Of these 59, 11 will have immigrated to Canada in the preceding 10 years (there will have been 5 such immigrants who are above-LIM). Of the remaining 48 below-LIM seniors who did not immigrate recently, 17 will be men and 31 will be women and of these 12 men and 26 women will be currently unmarried (that is divorced, widowed or never married, with common law marriages counted as marriages). Only 10 of the original 59 will be married non-immigrants.

There are many considerations involved in distribution policy, among them measurement, life cycle issues, marriage penalties and the common tradeoff between economic inequality and economic inefficiency. However the evidence here suggests that the policy maker whose sole goal was to reduce the aggregate number who are below-LIM in the senior population of Canada should target the support to immigrant seniors, seniors supporting children and currently unmarried seniors, particularly women. Targeting by age would not appear to be particularly worthwhile.

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TABLE 1 Senior Below-LIM Rates and Comparators from the Luxemburg Income Study, Selected Various Countries, Percentages, 1970 – 2000					
Country	Measure	1970*	1980*	1990*	2000*
Canada	Senior (LIM = 50% of Median)	37	22	6	6
	Senior (LIM = 40% of Median)	17	7	1	1
	Senior (LIM = 60% of Median)	52	39	19	17
	Child (LIM = 50% of Median)	17	15	15	15
	Total Population (LIM = 50% of Median)	16	12	11	11
Australia	Senior (LIM = 50% of Median)	n.a.	24	23	23
	Senior (LIM = 40% of Median)	n.a.	4	6	5
	Senior (LIM = 60% of Median)	n.a.	50	46	47
	Child (LIM = 50% of Median)	n.a.	14	15	15
	Total Population (LIM = 50% of Median)	n.a.	11	12	13
Germany	Senior (LIM = 50% of Median)	18	14	11	10
	Senior (LIM = 40% of Median)	10	8	6	4
	Senior (LIM = 60% of Median)	28	26	22	18
	Child (LIM = 50% of Median)	4	3	4	9
	Total Population (LIM = 50% of Median)	7	5	6	8
Netherlands	Senior (LIM = 50% of Median)	n.a.	4	3	2
	Senior (LIM = 40% of Median)	n.a.	3	2	1
	Senior (LIM = 60% of Median)	n.a.	7	20	13
	Child (LIM = 50% of Median)	n.a.	3	8	10
	Total Population (LIM = 50% of Median)	n.a.	4	6	7
Sweden	Senior (LIM = 50% of Median)	14	3	6	8
	Senior (LIM = 40% of Median)	1	0	2	2
	Senior (LIM = 60% of Median)	35	12	20	21
	Child (LIM = 50% of Median)	2	5	3	4
	Total Population (LIM = 50% of Median)	6	5	7	6
UK	Senior (LIM = 50% of Median)	15	22	24	20
	Senior (LIM = 40% of Median)	3	4	8	10
	Senior (LIM = 60% of Median)	36	50	44	34
	Child (LIM = 50% of Median)	6	9	18	15
	Total Population (LIM = 50% of Median)	6	9	15	12
USA	Senior (LIM = 50% of Median)	28	27	22	25
	Senior (LIM = 40% of Median)	16	17	13	15
	Senior (LIM = 60% of Median)	38	37	30	33
	Child (LIM = 50% of Median)	19	20	26	22
	Total Population (LIM = 50% of Median)	16	16	18	17
The low income measure (LIM) is 50% (or some other per cent if specified) of family income, adjusted for family size by dividing by the square root of number of members in the family.					
* Years given are approximate because rates are not calculated annually. The exact years are Canada (1971, 1981, 1991 and 2000), Australia (1981, 1989, 2001), Germany (West Germany 1973, 1981, 1989 + all Germany 2000), Netherlands (1983, 1991, 1999), Sweden (1975, 1981, 1992, 2000), United Kingdom (1969, 1979, 1991, 1999) and United States (1974, 1979, 1991, 2000).					
Source: Luxembourg Income Study (September 21, 2006)					

TABLE 2 Senior Below-LIM Rates, Canada, By Gender, Age and Marital Status, Longitudinal Administrative Database, Percentages, 2004					
	Married	Widowers/Widowed	Divorced	Separated	Never Married
Males					
Age 66-70	4	6	6	9	12
Age 71-75	4	5	6	8	11
Age 76-80	3	4	5	7	12
Age 81-85	3	4	5	8	11
Age 86-90	3	4	6	8	13
Age 91+	4	6	8	10	14
Females					
Age 66-70	3	10	12	18	16
Age 71-75	2	8	12	18	15
Age 76-80	2	7	11	20	16
Age 81-85	2	7	10	20	15
Age 86-90	1	8	12	22	14
Age 91+	1	12	21	25	16
The low income measure (LIM) is 50% of family income for Canada, all ages, with an adjustment for family size. Age is the age as of December 31, 2004.					

TABLE 3 Senior Below-LIM Rates, Canada, Immigrants, Longitudinal Administrative Database, Percentages, 2004	
Landed 1999-2003	77%
Landed 1994-1998	67%
Landed 1982-1993	18%
Age 66-75	70%
Age 75+	73%
Male	65%
Female	76%
Male married	64%
Male unmarried	72%
Female married	67%
Female unmarried	80%
Unless otherwise specified, all calculations are for immigrants who landed in Canada between 1994 and 2003. All were 66 years of age or older as of 2004.	

TABLE 4 Odds Ratio Estimates for 2004 Above-LIM Status Derived from Various Logit Specifications, Percentages, Senior Men and Women		
	Men	Women
Above-LIM Status, 1994	6.958	6.454
Widowed	0.632	0.180
Divorced	0.633	0.142
Separated	0.428	0.079
Never Married	0.308	0.099
Presence of Dependent Children	0.197	0.131
Immigrant (landed after 1993)	0.096	0.079
Number of observations	310810	423365
In all cases the confidence intervals are tighter than $\pm 10\%$ of the coefficient values, in most cases substantially tighter. In all cases the p-value of the null hypothesis that the odds ratio is one is less than 0.0001. For almost all immigrants there is no information on their 1994 Above-LIM Status and hence they are coded as Below-LIM for that year, probably a reasonable approximation given Table 3.		

TABLE 5 Some Comparisons Between All Seniors and Below-LIM Seniors Using Income Tax Data, Percentages, Percentages, 2004		
	All Seniors	Seniors Below-LIM in 2004
Had capital gains > \$1000	7.0	0.5
Had gross farm or fishing income > \$1000	2.1	2.5
Had gross rental income > \$1000	5.6	2.1
Charitable donations > \$500	16.2	0.7
Had self-employed income < \$1000	1.8	3.5
Below-LIM 2003, aged 66 to 70 in 2004	4.4	59.1
Below-LIM 1999, aged 66 to 70 in 2004	10.8	62.6
Below-LIM 1994, aged 66 to 70 in 2004	10.8	58.3
Indian Exempt Employment Income > 0, any year 1999 to 2004, aged 66 to 70 in 2004*	0.2	0.6
Not immigrants 1994 or later and no OAS	1.1	8.9
*The Indian Exempt Employment Income variable is only available for 1999 to 2004 and the age restriction is because seniors older than 69 in 2004 were very unlikely to earn such income during 1999 to 2004.		

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