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Are Canadian Couples Better Off or Just Working Harder?

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1. Introduction

Are Canadian married couples really better off in 1994 than they were in 1975, given the increased time spent to acquire earned income? Are Canadian married couples better off than similar couples in other countries if one takes account of the differences across countries in the time spent earning income? Although there has been a growing concern in understanding the impact of increased labour force participation of married women and the emergence of the "dual earner" family in Canada on the level and distribution of household earnings and income[1], little attention has been given to the change in the amount of labour time devoted to earning income, and the extent to which this also impacts the level of economic well-being of families. The counterpart to increased market earnings of second earners in the household is a decline in the number of hours available for domestic production in the home and for leisure.

The value of non paid work time is now widely recognized as an important indicator of economic well-being. In fact, the demand to recognize and value non-paid production, including household work, in a national accounting sense (Clift and Wells, 1990) has lead Canada to pioneer efforts to value housework in monetary terms. Methodologies to value non paid production, initially developed in the mid-1970s, have been updated using time-use surveys to produce estimates on a regular basis.[2]

Together, husbands and wives in Canada are spending more time in paid employment, which has occurred, to a large extent, due to the increased labour force participation of women. Where the social norm in Canada used to be one earner within the family unit, the norm has now moved to two-earner families. In 1967, only one-third of husband-wife families (with and without children) were families in which both spouses reported earnings, but by 1988, dual earner families represented approximately 62% of all husband-wife families.[3] The percentage distribution of husband-wife families in Canada by earning status of spouses from 1967 to 1995 is shown graphically in Appendix Figure A-1. Dual earners also represent the majority of husband-wife families with children. By 1995, both parents were employed in approximately 70.7% of two-parent families.

Average annual hours worked, however, mask what is happening to hours of work throughout the earnings distribution within a country. Examining the distribution of average annual hours of paid labour for married couples in Canada at each vingtile of the earnings distribution for selected years over the period from 1975 to 1994, (Figure 1), reveals significant differences in the number of hours spent in paid labour for married couple households at every point in the

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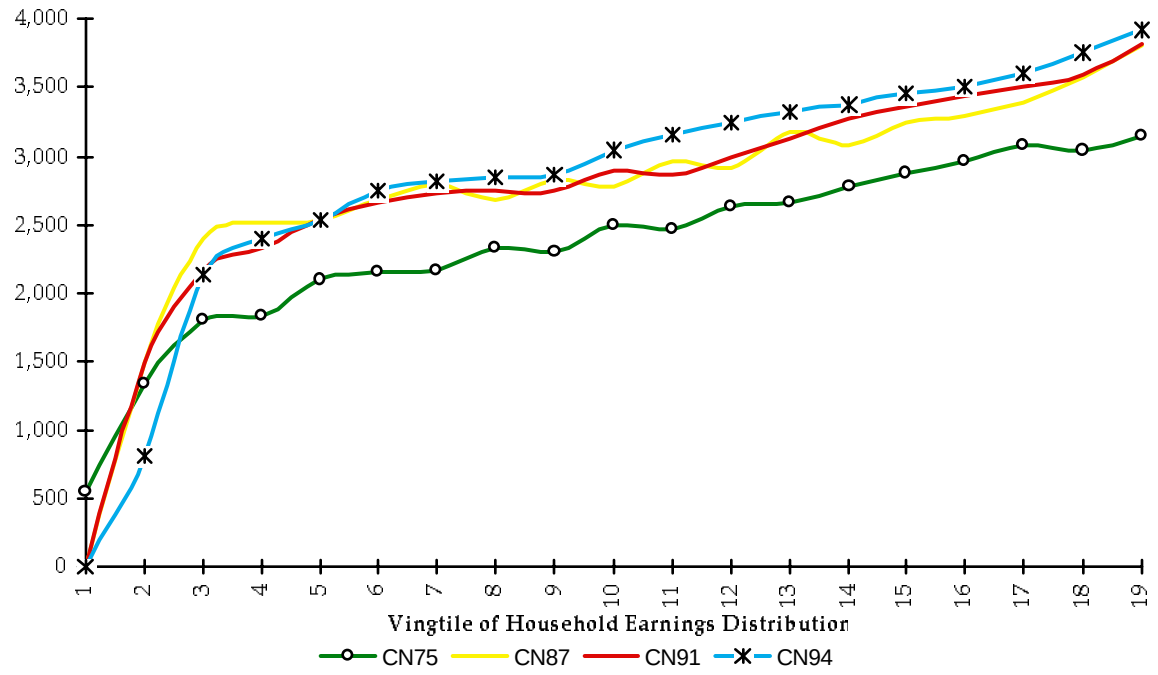
1 Saunders, O'Connor and Smeeding (1994); Saunders (1993) Danziger (1980), Cancian, Danziger and Gottschalk (1993), and Cancian and Schoeni (1992)

2 Barbara Clift and Stewart Wells, "The Reliability of the Canadian National Accounts Estimates", Canadian Economic Observer, Statistics Canada Catalogue 11-010, February, 1990.

3 Source: Statistics Canada, Household Surveys Division, "Characteristics of Dual earner families, 1991 (Ottawa: 1993) Catalogue # 13-215, Table 5.

earnings distribution. (See Appendix Table A-1). Canadian couples are spending a great deal more time in the paid labour market in 1994 than they did in 1975.[4]

Figure 1
Total Annual Household Hours Worked; Actual Earnings Distribution
Canada (1975-1994)



One of the most striking features of the analysis of paid labour time by Canadian households is the substantial increases in hours worked throughout the distribution over time. In 1975, the average annual household hours worked in the 20th vingtile of the household earnings distribution was 3,097 hours. By contrast, in 1994, the average annual hours worked in the 20th vingtile was 4,027 hours. This represents an increase of roughly 1,000 hours worked by the household per year or roughly 20 hours per week. Similarly, households at the 15th vingtile of the earnings distribution worked an average of 2,876 hours in 1975, versus 2,457 hours worked by households in 1994. Again, this represents an increase of roughly 600 hours worked per household. Large increases is annual household hours worked per year are evident from the 60th percentile upward when comparing the household earnings distributions of 1975 and 1994. An average of 700 hours worked per year per household is equivalent to every household supplying 14 more hours of paid work per week. While the trend toward increases in two earner households in Canada may result in higher earned income, these trends do not necessarily imply increased economic well-being. Examining the distribution of household earnings, without an examination of the changes in hours worked over time in Canada ignores

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4 The Average annual hours household worked is computed hours for each vingtile of the earnings distributions of married couple households using the Luxembourg Income Study (LIS) database. Average annual hours of paid labour for married couples are examined for the years 1975, 1987, 1991 and 1994 .A description of the data used is provided below in Section 3 of this paper.

the impact on households of allocating additional time to the paid labour market away from potential household production or leisure activities.

Substantial differences in hours of paid labour have also emerged among several OECD countries over the 1980's and early 1990's.[5] During this period, the amount of time spend in paid employment by Canadians and Americans compared to Western European workers increased noticeably.[6] Table A-2 presents the differences in annual hours worked among advanced OECD countries.[7] Bell and Freeman (1996) in their study "Changes in Work Time in Canada and the United States" examined differences in annual hours worked among advanced OECD countries. One notable pattern, identified by Bell and Freeman, which emerges is the correlation between the "English-speaking" countries and high average annual hours worked per adult. Average annual hours worked per adult are greatest in the United States, Australia, the United Kingdom and New Zealand, followed by Canada.[7] The Scandinavian countries such as Sweden and Finland rank next, with relatively high hours worked per adult. Average hours worked in the OECD European countries such as the Netherlands, Germany and France are much lower, with the Netherlands showing the lowest average annual hours worked per adult among the OECD European countries.[8] The five countries examined in this paper, Canada, United States, Australia, Finland and the Netherlands, are selected based on the wide variation in annual labour market hours for husbands and wives.

Average annual hours worked, however, mask differences in hours of work throughout the earnings distribution across countries. Comparing average annual hours worked by married couples at each vingtile of the earnings distribution amoung the five countries examined in this study (Figure 2) reveals striking cross-country differences in the supply of annual hours of paid labour.[9]

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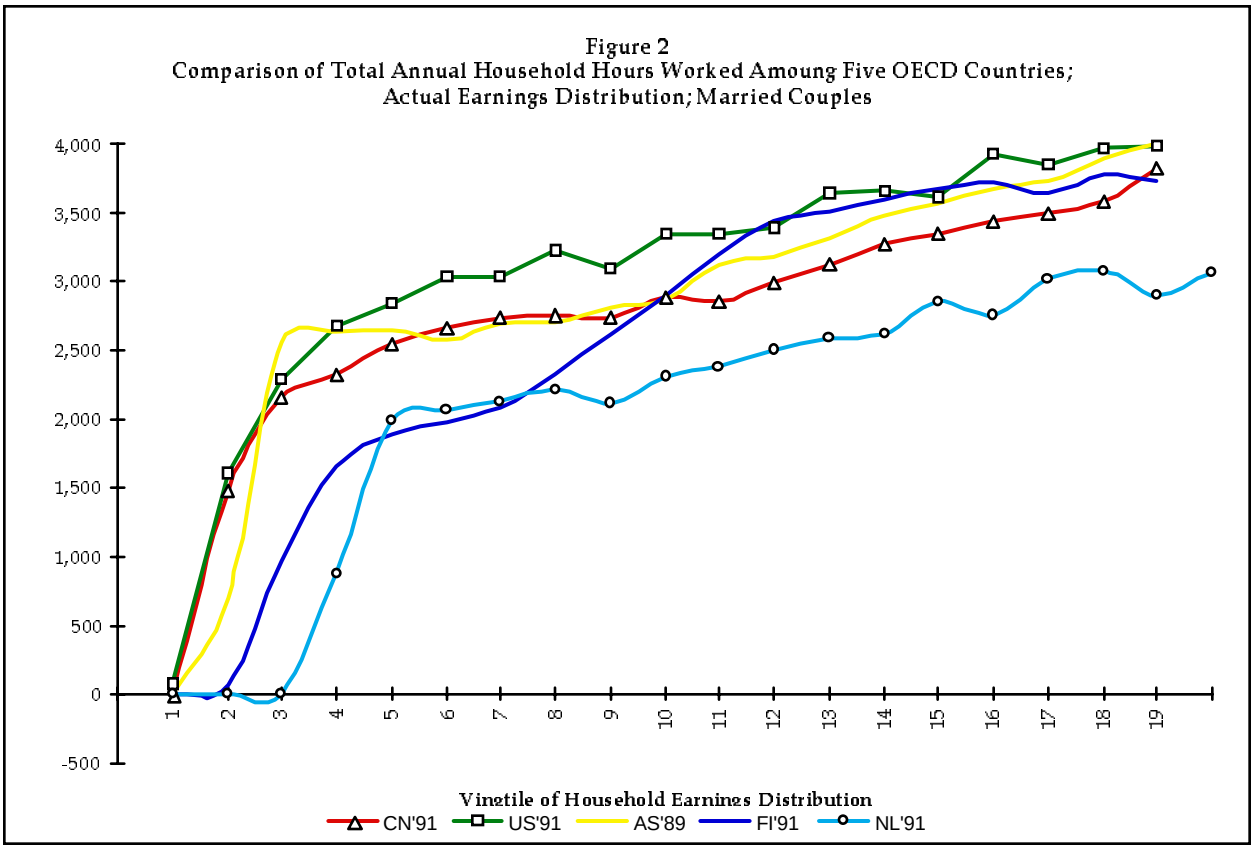
5 Source: OECD Employment Outlook, 1995, Table A, Table C.

6 Americans and Canadians spend more hours in the paid labour than Western Europeans who enjoy considerable leisure while employed as well as longer vacations and holidays. In fact, in many European Union countries work-sharing is encouraged as a method for dealing with unemployment.

7 The exception being Japan, which has the highest average annual hours worked per adult.

8 Bell and Freeman (1996) found that the differences in hours worked between North Americans and Western Europeans to be a relatively recent phenomenon, developing in the 1970s and 1980s.

9 The figures in Figure 2 represent average annual hours worked per married adult at each vingtile of the earnings distribution, with household head aged 15 to 64. Data taken from LIS micro data country files for 1991 for Canada, the United States, Finland and the Netherlands and 1989 for Australia.



The average annual household hours worked across countries within each vingtile of the earnings distribution shown in Figure 2 is given in Appendix Table A-2. The average annual household hours worked throughout the earnings distributions in each country is also shown at the bottom of Table A-2. This analysis shows average *household* hours worked follow the same ranking as average annual hours worked *per adult* reported as reported by the OECD across the countries examined in this study.

Examining the entire distribution of hours worked across countires provides a more complete understanding of the distribution of household hours embodied in the average hours worked. Figure 2 reveals that couples in the United States spend more time in the paid labour market, throughout most of the earnings distribution, than do families in other countries. At the bottom of the earnings distribution, the US is followed by Canada with the next highest number of household hours spent in the labour market. Average household hours worked in Canada however, experience a slight decline at around the median with average household hours worked dropping off. Hours worked by married couples in the Netherlands are the lowest overall, with the lowest distribution beyond the 8th vingtile of the earnings distribution. Married couple households in the Netherlands work on average 600 to 800 hours less per year than households in the other five countries examined in the upper end of the earnings distribution. Based on a 50-week work year, this translates into 12 to 16 hours less each week.

Comparisons of earned incomes of families across countries, even when standardized for prices and family size, (and the subsequent measures of inequality based on these incomes), are likely to give misleading implications of the relative level and distribution of economic well-being,

since they implicitly assume everyone has the same amount of time available for home production and leisure.

This paper examines the relationship between the distribution of average annual household pre-tax earnings and average annual household hours of market work for married couple households. The point of departure in this paper is the treatment of the variation in annual hours worked either over time within Canada or across countries. This paper adds to the literature explicit consideration of the differences in hours worked across households, (across countries or over time periods), by proposing an additional standardization of household earnings to account for differences in the number of hours worked across households. Total annual household hours worked by couples are fixed to a common number of hours and household earnings are derived based on assumptions regarding the manner in which couples could potentially package their labour supply.[10] Annual household earnings, adjusted for differences in prices, family size, and hours worked are compared to determine whether or not the standard of living derived from these adjusted earnings differs.

The objective of standardizing household hours is to determine if, when we adjust for differences in time spent working, whether or not there are differences in the earnings distributions of married couples. In the case of a within country analysis, adjusting household earnings for differences in prices, family size, and hours worked, allows one to determine if, all else equal, families are any better off now than they were in previous years, where the average annual hours worked by husbands and wives were less. In the case of a cross-country analysis, further standardizing household earnings for differences in hours spent working addresses the second question of determining the relative economic well-being of Canadian married couples and similar couples in other countries. Also novel to this paper is the examination of average annual hours worked at each vingtile of the earnings distribution. This allows for a clearer understanding of annual average hours worked at both the bottom and the top of the distribution, rather than using an overall average hours worked.

A brief review of the relevant literature is provided in Section 2. Section 2.1 presents a review of the literature concerning the impact of changes in hours worked and the resulting the impact earnings for Canadian households and Section 2.2 presents a brief review of the literature concerning cross-country comparisons of the impact of differences in hours worked in earnings and economic well-being. A description of the data, the sample selection criteria, and the methodology used to standardize married couples' earnings in this study is contained in Section 3. This section includes a discussion of the derivation of the household pre-tax earnings distribution. Section 4 presents a comparison of the resulting pre-tax earnings distributions over time in Canada when standardized for differences in household hours worked. Household hours are fixed at both the average annual household hours worked in 1975 in each vingtile of the earnings distribution and at common number of hours (2,000 hours) throughout the earnings distribution.[11] While earnings in 1994, adjusted for prices and family size, show Canadian households to be maintaining a comparable standard of living as compared with

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10 The total household earnings for married couples rather than the individual earnings of husband and wife are examined in order to facilitate an examination of the relationship between household hours of paid labour and the way in which husbands and wives "package" their combination of paid and unpaid work.

11 The choice of 2,000 hours is based on 40 hours of work per week over 50 weeks of work per year.

previous periods, once we account for the differences in the amount of time spent to acquire these earnings, Canadian households in 1994 are not as well off as they were in 1975 in the bottom 65 percent of the earnings distribution.

Section 5 presents the cross-country comparison of actual pre-tax household earnings, expressed in 1991 US dollars, adjusted for differences in prices across countries using a PPP index, equivalized for real purchasing power by adjusting for differences in family size using an OECD equivalence scale, and adjusted for differences in hours worked, throughout the earnings distribution in each of the selected countries in the sample. Two alternative levels of annual household hours worked are used as the standard number of annual hours worked across countries: annual household hours worked are standardized to the average annual household hours worked in the US at each vingtile of the earnings distribution and to a common number of hours (2,000 hours) throughout the distribution. The results of the cross-country analysis show, that when household earnings are adjusted for differences in hours worked, countries, such as the US, in which households supply greater hours of paid labour are not as well off as countries in which households supply fewer hours of paid labour, in the lower portion of the earnings distribution.[12] Section 6 presents the conclusions.

12 This assumes a positive value to time spent outside the labour force.

2. Literature Review

2.1 Literature Review: Canadian Analysis

Much of the literature concerned with the relationship between employment earnings and the economic well-being of families in Canada has focussed on the level of earnings, (or lack thereof), the distribution of earnings or measures of inequality in earnings in general.[13] However, very little attention has been given to the amount of labour time embodied in earned income, and the extent to which this also impacts the level of economic well-being of families. Canadian households have been spending more time in the labour market over the past twenty years, due largely to the increased labour force participation of women.

Studies have found that the rising inequality in Canada in annual labour market incomes, has been offset by social transfers so that, unlike the United States, the final distribution of total household incomes in Canada have been relatively stable in the 1980's (Economic Council of Canada (1991); Wolfson (1992); Blank and Hanratty (1991); Love and Poulin (1991)).

Canadian studies (Leckie (1988); Myles, Picot and Wannell (1988); Burbidge, Magee and Robb, (1993)) have also documented the rise in earnings inequality for individuals and the polarization of the labour force which took place between 1981 and 1986 in Canada. Wolfson (1992) and Beach and Slotsve (1994) found this shift was not simply a cyclical phenomenon induced by the recession of the early 1980's. Beach and Slottsve found that overall earnings inequality in Canada increased less than the distribution of individual earnings. Morissette, Myles and Picot (1994) concluded that the rise in inequality and polarization observed in the 1980's is not due solely to the 1981-83 recession, but they found that shifts in Canadian earnings inequality, at the aggregate level, were mainly driven by changes in the distribution of annual hours worked. They focus their analysis on individual annual earnings inequality rather than on household or family economic inequality changes and they show that increased female labour force participation over the past two decades may have had partial offsetting effects in terms of household economic inequality.

As pointed out by Picot (1996), in most of the work on increasing earnings inequality in Canada, changes in the distribution of working time have been largely ignored. Freeman (1994), Juhn, Murphy and Topel (1991) and Kuhn and Robb (1996) have examined the declining hours of work of lower paid, less skilled workers relative to the higher paid resulting from a supply side response on the part of workers. Studies which have recognized the polarization in hours worked through the 1980s as influencing the degree of earnings polarization for individuals include Picot, Myles and Wannell (1990), McPhail (1993) Morrissette, Myles and Picot, (1994) and Morissette (1995). They found that the increased polarization in hours worked increased inequality in annual earnings inequality, with the more highly paid individuals working longer hours versus the less paid working relatively shorter hours.

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13 Studies on the increased polarization of employment earnings in Canada include: Myles and Picot, (1988); The Economic Council of Canada, (1991); Morissette, Myles and Picot (1994); Burbidge, Magee and Robb, (1993); Beach Slotsve, (1994). The relationship between declining real and relative wage of young workers and increased earnings polarization have also been analyzed: Myles, Picot and Wannell, (1988); Davis, (1992); Betcherman and Morrissette, (1994).

2.2 Literature Review: Cross-Country analysis

Evidence that the trend toward narrowing earnings distributions experienced during the post-war period was reversed during the 1980s in many OECD countries has generated much research in the area of earnings inequality.[14] Although much of the research in cross-national comparisons of earnings inequality has focussed on trends in male earnings inequality, reflecting the lack of comparable data across countries[15] as well as a focus on the distribution of wages in an attempt to explain the distribution of earnings,[16] several studies have examined the distribution of female earnings. This research has concentrated primarily on examining the correlation between husbands' and wives' earnings and the impact of wives' earnings on family income inequality.[17] Two important facets of the literature on cross country earnings dispersion which are of relevance to this paper deserve mention. First, there is a general recognition in the literature that individual's total earnings are determined not just by their earnings per hour but also by the number of hours they work, and that differences in hours worked should be studied when examining earnings inequality, [18] However, it also recognized that in proceeding from the study of individual wage inequality to the study of household income inequality, one is necessarily led to consider theories of family formation and family labour supply. Second, there has also been a general recognition, evident in the empirical analysis that differences in earnings and income inequality trends across countries must be put into context against the backdrop of differences in their social and institutional framework.[19] Although studies such as Blackburn and Bloom (1994) do not attempted to develop and estimate a structural model of family earnings, their empirical results are tempered by a recognition of variations across countries in household hours worked. Blackburn and Bloom (1994) analyze only families headed by married couples in order to facilitate analyze the influence of the growth in two-earner couples on overall income inequality across countries.[20]

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14 Studies in this area include OECD, 1993, Chapter 5; Blackburn and Bloom, 1994; Saunders, O'Connor and, 1994; Atkinson, 1995; U. Wagschal, 1997; Danziger, S., 1980; Danziger, S., and Gottschalk, P., 1993; Green, Coder and Ryscavage, 1992 and Katz and Murphy (1992).

15 This is acknowledged in the research of authors such as Blackburn and Bloom, (1994), Saunders, O'Connor and, (1994), U. Wagschal, (1997), and Danziger, S., (1980). However the emergence of efforts toward improved comparability in data, such as the LIS micro-data sets, has facilitated cross national comparisons of the level of earnings inequality.

16 Since the large changes in labour force participation of women, experienced in many countries, make it difficult to separate changes in the distribution of wages from changes in the composition of the female labour force, earnings and wage inequality research was directed primarily, although not exclusively, on male earnings.

17 For example, see Cancian Danziger and Gottschak (1993); Karoly and Burtless (1993); Blackburn and Bloom (1994); Saunders (1993); and Beach and Slottsve (1994).

18 See for example, Blackburn Bloom (1994); Bell and Freeman (1996), OECD (1993, 1995).

19 Freeman, (1994); Gottschalk and Smeeding (1995); Katz and Murphy, (1992).

20 One of the key empirical results which emerges from the analysis of Blackburn and Bloom (1994) is that increased income inequality in the United States in the 1980s is associated with a sizable increase in the correlation between husbands' and wives' earnings.

The contribution of the earnings of a second earner in families to the level of and distribution of family earnings and income has become an area of income distribution analysis of increasing interest and policy relevance. Saunders, O'Connor and Smeeding (1994) provide evidence to suggest that cross-country variations in female participation rates are a factor underlying cross-country differences in the distribution of family earnings and incomes. They found married women's earnings cause a reduction in income inequality among married couples across countries. Other studies which found that the earnings of wives has had an equalizing effect on the distribution of family income for a range of countries include: Saunders (1993) for Australia, and Danziger (1980), Cancian, Danziger and Gottschalk (1993), for the United States and Cancian and Schoeni (1992) for a range of countries, including Australia, Canada, United States, and the Netherlands, which are of particular relevance to this study.[21] Cancian Danziger and Gottschak (1993) apportion little of the change in family income inequality to wives' earnings, whereas Karoly and Burtless (1993) and Blackburn and Bloom (1994) give them a larger role. Saunders (1993) found that in Australia, changes in married women's earnings lead to increased earnings inequality in the 1980s, whereas, Beach and Slottsve (1994) found the opposite effect in Canada. There is however, wide agreement that the correlation in earnings among husbands and wives has never been large, but has grown during the 1980s, which would make wives' earnings more disequalizing.

The approach used by Cancian and Schoeni (1992) and Saunders, O'Connor and Smeeding (1994) is similar, where the actual distribution of family income is compared to an estimate of family income if each country had the **same** female labour force participation rate. This involves comparing the actual distribution of income with the distribution of income where all the earnings of wives are set to zero. The countries examined by Saunders, O'Connor and Smeeding also included Australia, Canada, United States, and the Netherlands, and in addition, (West) Germany. In all five countries examined, they found the actual distribution of earnings of couples Lorenz-dominated the earnings distribution where only husbands worked. They also found the actual earnings distribution of couples is less equally distributed in the United States than the earnings distribution of husbands alone in the Netherlands.

While studies have shown that married women's labor force participation reduced the measured level of overall earnings inequality in many countries, (Cancian, Danziger and Gottschalk, Saunders (1993)), these same studies also found that increased labour force participation of married women may not always have an equalizing effect on earnings distributions. Cancian, Danziger and Gottschalk, (1993) found the participation rate of wives whose husbands have the highest earnings has increased disproportionately in the U.S. Therefore the traditional explanation of the equalizing impact of wives earnings may be reversed. Also, due to assortative mating, the correlation of spouses' earnings may have risen. Saunders (1993) examined Australian data and also found that it is possible that the size of the equalizing impact of wives earnings may decline over time.

It is also recognized in the literature on cross-country earnings comparisons that the counterpart to the increased market earnings of married women is a decline in either the number of hours of domestic production worked in the home or in leisure time available.

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[21] The countries analyzed in the Cancian and Schoeni study include: Australia, Canada, United States, the Netherlands, France, West Germany, Israel, Norway, Sweden, and the United Kingdom,

(Saunders, O'Connor and Smeeding, (1994)). The resulting impact on the value of home production and leisure time available act to offset the increase in economic welfare of the family resulting from the increased money income due to the "second earner".[22] Economist have argued for many years that ignoring the income and wealth generated by housework introduces a bias in various areas of economic analysis. Mitchell et al. (1921), Kuznets (1944) and Clark (1958), have pointed out that national income is significantly underestimated by not taking into account income in-kind provided by productive household activities. Weinrobe (1974) noted that measured growth rates are biased upwards as more and more women move into the labour market since no allowance is made for the resulting decline in non-market household production. These considerations have prompted studies in which authors develop alternative measurement methods in recognition of the value added of productive activities of households outside the market. For example, the earnings capacity approach used by Saunders, O'Connor and Smeeding, (1994), which involves replacing actual earnings (whether positive or zero), by an estimate of full-time earnings capacity.[23]

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22 It is further recognized by Saunders, O'Connor and, (1994) that the degree of such overstatement is likely to vary across families within and between countries, thus affecting the interpretation of national and cross national differences in the distribution of (money) income.

23 Full-time earnings capacity is derived using estimates of conventional human capital earnings functions.

3. Data Description, Sample Selection and Methodology

3.1 Data Description and Sample Selection: Candian Analysis

In the Canadian analysis, the pre-tax earnings distributions for married couple households are examined over the period from 1975 to 1994. The specific years of analysis are 1975, 1987, 1991 and 1994. Data on Canadian earnings is taken from the Luxembourg Income Study (LIS) data. The original source of the LIS data for Canadian households is the Canadian Survey of Consumer Finances. One major advantage of using the LIS data as a source for the Canadian data rather the micro data files from the Canadian Survey of Consumer Finances is that information on household hours worked for both household head and spouse is available in the LIS data for the years prior to 1987, but not available on the micro data files from the Survey of Consumer Finances.[24]

Households selected are specified as married (or equivalent), containing a household head, (aged 21 to 65), with a spouse present. Records which reported hours worked but zero earnings were omitted from the sample to facilitate the standardization procedure used.[25] All households with negative earnings are excluded from the sample, but all households with zero earnings are included in the sample. Both full-time and part-time earners are included in the sample. Households which reported zero or negative disposable incomes were excluded from the sample. Self-employed persons are included in the analysis for each country selected. Table A-4 in the Appendix shows the impact on the weighted sample size of the LIS data for each of the sample selection criterion used.

For the years 1987 to 1994, households are defined as single family units, corresponding to the definition of the "Census Family", by Statistics Canada.[26] For 1975 the household units contained in the LIS survey data (Canadian Survey of Consumer Finances) are defined as "Economic Families", a broader definition of family than the single family unit. Economic families include single family units plus households with where a husband, wife and children may be also living with other relatives. However, for the purposes of this paper, we are

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24 The variables on household hours worked are available through the LIS data due to a special request to match files with the Canadian Labour Market Activity Survey so that these files would correspond to the LIS data format. Information on hours worked for individual records is not available through the Canadian Survey of Consumer Finances micro data files prior to 1987.

25 This is due to the fact that the household earnings distributions are broken down into vingtiles based on the actual household earnings distribution for each year. Records with reported earnings, but no reported hours worked are placed within a particular vingtile of the earnings distribution, based on reported actual earnings, and remain in that vingtile under each of the standardizations considered. If average hours worked are reported as either zero or missing, this may seriously alter the average "standardized" earnings within each vingtile computed through various standardization procedures.

26 The term Census Family refers to the traditional "nuclear" definition of family which includes a husband and/or wife, with or without children. The term Economic Family refers to a group of individuals who share a common dwelling who are either related through blood or marriage. This definition includes in-laws as well as persons adopted.

concerned only with households in which husband and wife (a couple) are present and the allocation of time between couples to paid work.[27]

3.2 Data Description and Sample Selection: Cross-Country Analysis

Data on hours worked for head and spouse of the household is available for all years selected in the sample. Data on household earnings in 1975 is not broken down into earnings of head and spouse, however, but is available for each of the subsequent years. The gender of the household head is given for all years in the sample but the gender of the spouse is not given. Households were selected if the gender of the household head was indicated, and a frequency was done on the gender of the head. In all selected years in the Canadian sample, all records reported household heads as male. Given this, earnings and the hours worked of the head were assigned as male earnings and hours worked and those of the spouse were assigned as female hours and earnings.

The data on earnings and hours worked for the five countries examined (Canada, (1991), United States, (1991), Finland, (1991), the Netherlands, (1991) and Australia, (1989)) is obtained from the country files contained in the LIS data base.[28] Table A-5 shows the original sources of the country-specific data used in this study. Extensive effort has been made by country specialists to make information on income and household characteristics contained in the LIS data as comparable as possible across countries.

Households selected are specified as married (or equivalent), containing a household head, (aged 21 to 65), and a spouse. The pre-tax earnings distributions for married couple households are examined across countries in each of the selected years. Households are further defined as single family units, corresponding to the definition of the "Census Family", by Statistics Canada. Records which reported hours worked but zero earnings were omitted from the sample to facilitate the standardization procedure used. All households with negative earnings are excluded from the sample, but all households with zero earnings are included in the sample. Both full-time and part-time earners are included in the sample. Households which reported zero or negative disposable incomes were excluded from the sample. Self-employed persons are included in the analysis for each country selected. Table A-6 in the Appendix shows the proportion of the weighted sample size affected by each sample selection criterion across countries. The gender of the household head is given for all countries in the sample but the gender of the spouse is not given. Households were selected if the gender of the household head was indicated. Earnings and hours worked of the head were assigned as male earnings and hours worked and those of the spouse were assigned as female hours and earnings.[29] Due to the lack of information on the gender of the spouse, households containing same gender couples cannot be identified

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27 The breakdown of the number of households from single family households and from multi-family households given by the weighted sample size for the years 1987, 1991, and 1994 are given in Table A-2 in the Appendix.

28 The country sample was selected on the basis of the variation across countries in annual household hours worked as well as providing a set of countries with the year of analysis as similar as possible.

29 A frequency distribution showed that in all households selected (where both household head and spouse are present) all records reported household heads as male for all selected countries in the sample.

This paper adopts the Purchasing Power Parity (PPP) index created by Summers and Heston (1991) to transform the distributions of Figure 1 into a common currency under the strong assumption that the PPP conversions reflect differences in purchasing power that are equal at all points in the distribution or, if they are not, that these differences across percentile points are the same in all countries.[30]

3.3 The Distribution of Household Earnings Defined

Total annual pre-tax earnings for married couples, (unadjusted for prices, family size or hours worked), within the selected sample were first sorted in ascending order and then split into twenty groups (vingtiles), of equal size for each year of analysis. Each vingtile contains an equal number of households for a given year of analysis. The average earnings and average number of hours worked within each vingtile are then calculated for males and females. For example, at the bottom of the earnings distribution, the average hours worked in the first vingtile of the distribution represents the average total household hours worked by all households included within this vingtile. This includes all households up to, and including the bottom 5th vingtile of the household earnings distribution.

Table A-7 shows the variables used to examine the distribution of earnings and annual hours worked. Data on annual pre-tax earnings is a reported variable in the LIS data set for all datasets used in the Canadian and cross-country analysis. Total annual hours worked is computed using total average hours worked per week multiplied by total weeks worked per year for both household head and spouse.

While standardizing earned income for differences in family size could alter the relative rank order of households in the earnings distribution, standardizing for hours worked certainly will alter the rank order of households in the earnings distribution. However, it should be stressed that the same households within each vingtile were used to examine hours worked and earnings for each of the subsequent adjustments to the earnings function. In this manner, the impact of each of the adjustments on earnings, and hours worked for males and females can be examined. Since each vingtile always contains the same households as were included in the actual unadjusted earnings distributions, the same households are compared throughout this analysis for any given year.

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[30] It should be noted that the use of purchasing power parity measures involve strong assumptions regarding cross-country comparisons of inequality.

4 Standardizing for Trends in Hours Worked: Candian Analysis

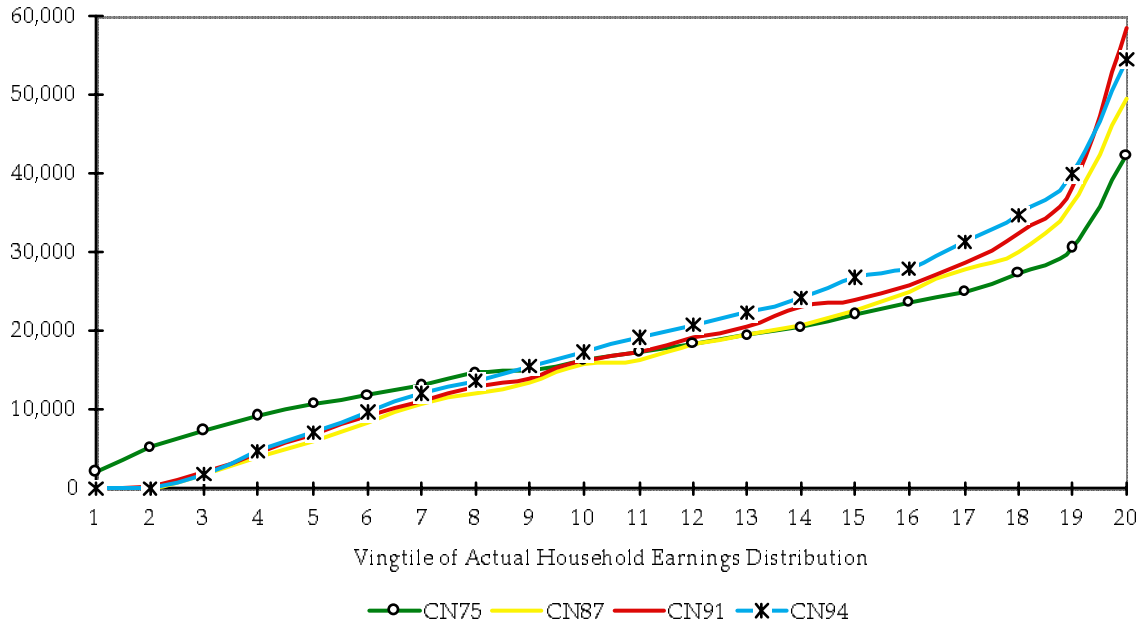
4.1 Canadian Married Couples' Earnings Adjusted for Differences in Prices and Family Size, 1975-1994

Married couples' earnings from 1975 to 1994 are standardized, adjusting for differences in prevailing prices over this time period using Statistics Canada CPI indices. All earnings are reported in 1994 Canadian dollars. Household earnings are adjusted for differences in family size using the OECD equivalence scale. Figure 3 shows the distribution of real household earnings adjusted for differences in prices and family size for each vingtile of the distribution. (See Appendix Table A-8).

Examining real household earnings, adjusted for differences in prices and family size (Figure 3), reveals that households in 1975 had greater equivalized earnings than did households in all other years in the bottom 40% of the distribution, but had lower equivalized earnings than did households in all subsequent years from the 15th vingtile upwards. Households in 1987 and 1991 show lower real earnings, standardized for prices and family size throughout much of the earnings distribution, except in the bottom 15% of the distribution, where average household earnings in 1987 and 1991 are greater than average earnings in 1994. Households in 1991 also show equivalized earnings greater than those in 1994 in the top 5% of the earnings distribution.

This analysis shows that although average family size in 1974 was larger than in 1994, couples had greater equivalized earnings in 1975 than did couples in subsequent years in the bottom 40% of the distribution.

Figure 3: Total Annual Household Pre-Tax Earnings Standardized For Differences in Prices and Family size; Actual Household Earnings Distribution; Canada, 1975-1994 (Valued in 1994 Dollars Cdn.)



4.2 Standardizing Household Hours Worked: Canada

The standardization procedure used to adjust household earnings for differences in hours worked is the Proportional Hours Standardization, where household hours worked are scaled up or down to the standardized number of hours by allocating hours to husbands and wives in proportion to their actual allocation of hours within the household.[31] The Proportional Hours standardization procedure is invariant to the choice of total standardized household hours used. Actual wages of individuals within the household are used to value their share of the standardized hours to calculate household earnings. [32]

Standardizing total household hours worked in proportion to actual hours worked by husbands and wives resulted in two separate standardization processes:

1) Establishing a common set of hours worked based on the average number of household hours worked in each vingtile of the distribution of earnings in 1975; and

2) Standardizing hours to a common number of hours (2,000 hours per year) based on the proportion of the hours worked by husband and wife to total household hours worked;[33]

The first procedure determines the hours to be the average number of hours worked in each vingtile of the distribution in 1975, and then allocates these hours based on the husband and wife's proportion of total household hours. The second procedure assumes a given amount of hours would be allocated based on the proportion of hours contributed to total household labour supply by husband and wife given in the data. The quantity of household hours selected in this study is 2,000 hours per year.

The result of the first Proportional Hours type of standardization procedure is shown in Figure 4. (See Appendix Table A-9). The 1975 adjusted earnings function again lies above the adjusted earnings of 1994 throughout the bottom half of the earnings distribution (up to the 13th vingtile). This would suggest that, if households in the years since 1975 worked the same number of average hours within each vingtile as did households in 1975, Canadian families in the years subsequent to 1975 have not obtained a higher standard of living in the bottom 65 percent of the earnings distribution. In leveling the playing field in terms of hours worked across time periods, Canadian households in the bottom 65 percent of the earnings distribution in the years subsequent to 1975 have not kept pace with the bottom 65 percent of households in 1975 in terms of household earnings.

The earnings distributions of 1991 and 1987 are indistinguishable from the 1994 adjusted earnings, especially in the bottom half of the distribution with the 1994 earnings distribution lying above that of 1987 and 1991 in the upper portion of the distribution. This result implies

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31 Two alternative standardization procedures used, (the High Wage procedure and the Wife as a Second Earner procedure) were also used to standardize average annual household hours worked yielded similar results.

32 The husband-wife ratio of hours worked within the household is maintained and is the same as the ratio for actual earnings distributions since the changes in hours worked are proportional for both husbands and wives.

33 This represents one possible choice of standardized hours, based on a 40 hour week for 50 weeks; any number of other hours may be used as a standardized number of hours.

that the additional hours worked in 1994 over previous years has not resulted in an increase in economic well-being, especially at the bottom of the earnings distribution. Households are supplying increasing hours in order to maintain their standard of living, and if we adjust earnings in terms of these additional hours, valued at the wages households receive for their labour time (assuming a proportionate combination of husband and wife's supply of household

Figure 4: Total Annual HouseholdEarnings Standardized For Differences in Prices, Family Size, Hours Worked; Hours Standardized to 1975 Hours Worked in Each Vingtile of the Earnings Distribution; Canada 1975-1994; (Valued in 1994 Dollars Cdn.)

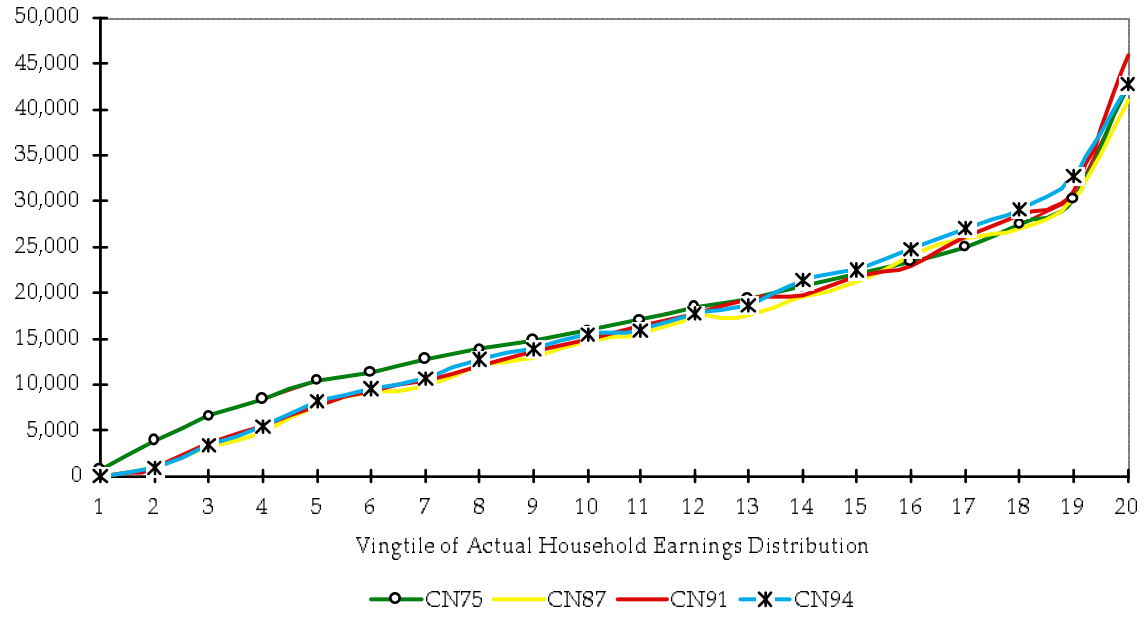
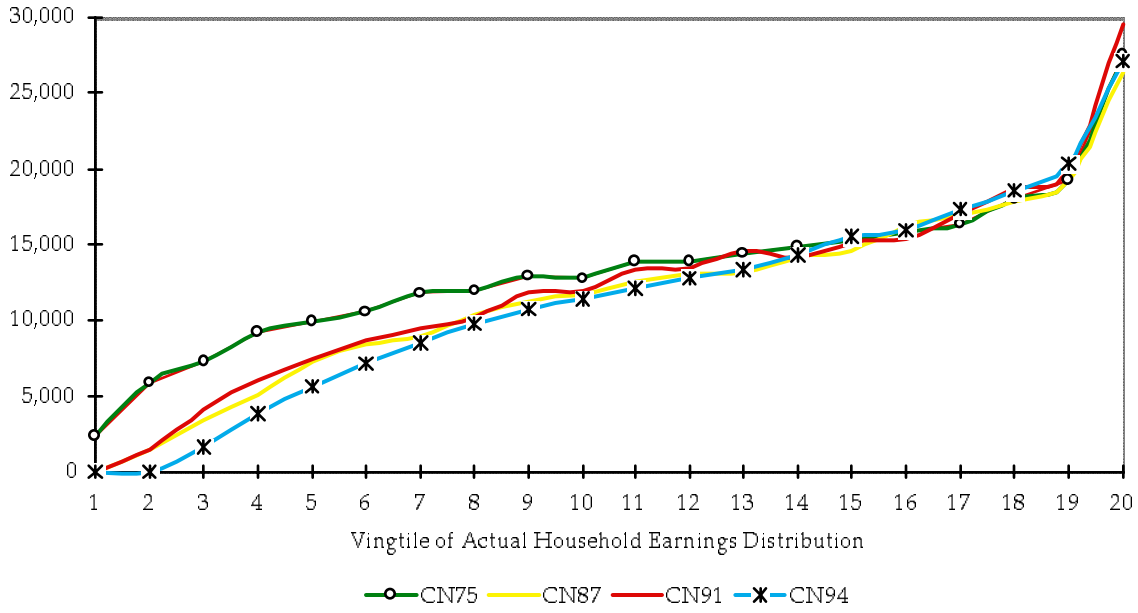


Figure 5: Total Annual Household Pre-Tax Earnings Standardized for Differences in Prices, Family Size and Hours of Paid Labour; Proportional Hours Standardization; 2,000 Hours; Canada, 1975-1994; (Valued in 1994 Dollars Cdn.)



labour), we see that the bottom 65 percent of households are not maintaining the standard of living that the bottom 65 percent of households did in 1975 in Canada.

The results of the second proportional hours standardization procedure are shown in Figure 5 below, (See Appendix Table A-10). As can be seen in Figure 5, the 1975 adjusted earnings lie above the adjusted earnings of 1994 throughout the bottom half of the earnings distribution up to the 15th vingtile (i.e., the bottom 75% of the household earnings distribution) and then lies very close to the adjusted 1994 earnings in the upper region of the distribution. Once earnings are adjusted for the variations in the amount of time spent in the workplace, the earnings distribution of 1994 (or at least in the bottom 75% of the earnings distribution) no longer lies above the earnings of previous years. This would suggest that not only were Canadian families at least as well-off in 1975 as they are today, but in fact they were better off (obtaining a higher standard of living) once we account the differences in time spent working between the earnings distributions. Not only does the hours-adjusted 1975 earnings distribution lie above the 1994 distribution, but also, the distributions of 1991 and 1987 lie above adjusted 1994 earnings throughout the bottom of the distribution (up to the 14th vingtile). In the top half of the earnings distribution all three adjusted earnings distributions are indistinguishable from the adjusted 1994 earnings distribution.

Both types of proportional hours standardizations methods resulted in comparable, if not higher, levels of earnings in the years prior to 1994 as compared to 1994. Once earnings are adjusted for the variations in the amount of time spent in the workplace, the earnings distribution of 1994 no longer lies above that of 1994. This would suggest that not only were Canadian households at least as well-off in 1975 as they are today for the bottom 65% of the earnings distribution, but in fact they were better off (obtaining a higher standard of living) once we account the differences in time spent working between the earnings distributions.

5 Standardizing for Differences in Hours Worked Across Countries

5.1 Cross-Country Comparison of Married Couples' Earnings Adjusted for Differences in Exchange Rates, Purchasing Power and Family Size, 1975-1994

Once household earnings are adjusted for prevailing currency and price differences across countries, real household earnings are further adjusted for differences in family size using the OECD equivalence scale.[34] Figure 6 shows the distributions of real household earnings, (valued in 1991 US dollars), standardized for differences in prices, purchasing power and family size for each vingtile of the distribution. (See Appendix Table A-11). As can be seen in Figure 6, average equivalized household earnings in the US are greater than equivalized earnings for all other countries examined throughout most of the distribution. Based on the distribution of real household earnings which has been standardized for differences in both prices and family size, households in the United States could be considered to be better off than households in other countries. However, a comparison of household earnings which have been fully adjusted for purchasing power, may not give a valid ranking of economic well-being if one considers the variation in hours spent in paid labour across the countries examined.[35]

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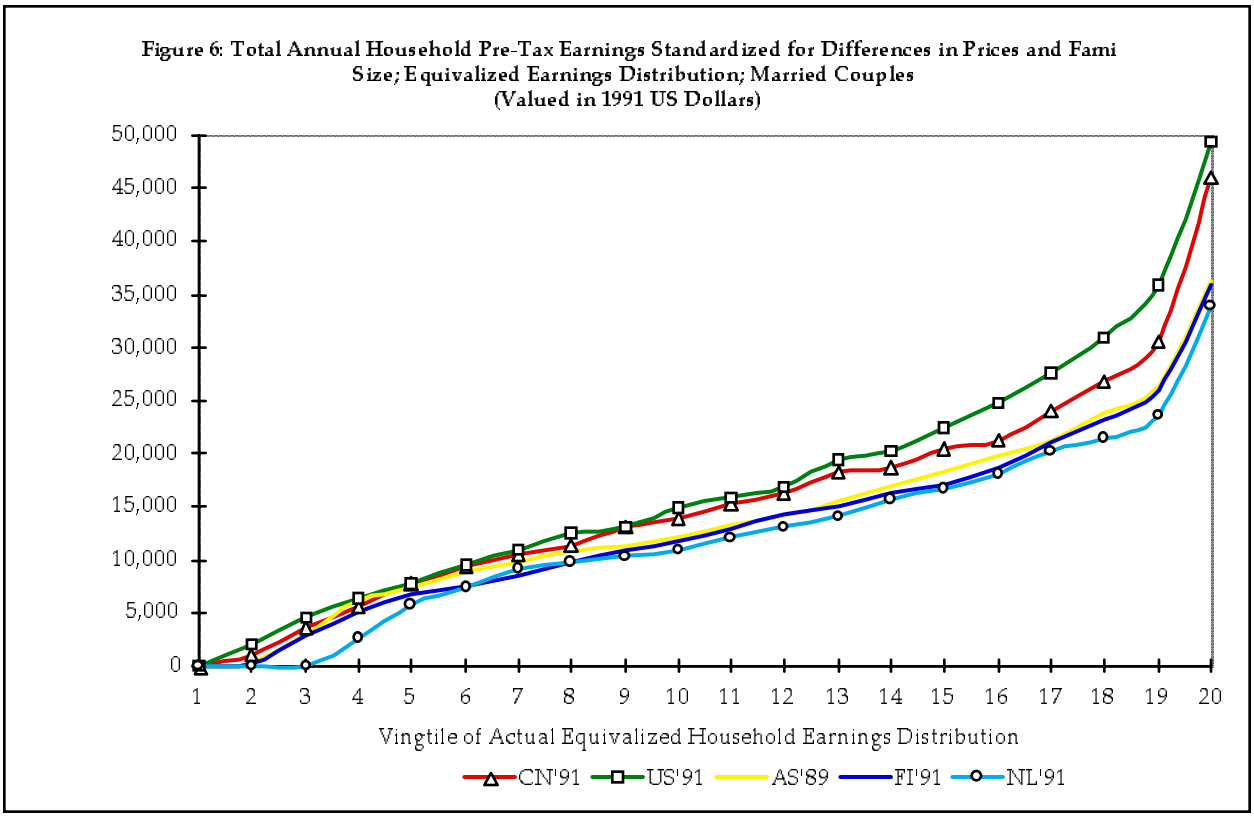
[34] The OECD equivalence scale calculates the equivalent earnings of each household member as: Equivalent Earnings = E/(1 + .7(A - 1) + .5(C)), where E represents household earnings, A is the number of adults in the household, and C is the number of children under the age of 18.

[35] Referring to earnings which have been fully adjusted for purchasing power includes the conversion of earnings to a common monetary unit, standardizing for differences in prices faced by households across countries, and standardizing for differences in family size across households.



5.2 Standardizing Household Hours Worked: Cross-Country Analysis

Given the variation in household hours worked among the five OECD countries examined, this paper proposes an additional standardization to facilitate cross-country comparisons of household earnings. As in the case of the Canadian analysis, the Proportional Hours standardization procedure uses the actual proportion of male and female (husband and wife) hours to total household hours in each household, to allocate a standard number of hours to the household. The existing share of husband's and wife's hours of paid labour hours are used to apportion the standardized number of hours between them. Standardizing total household hours worked in proportion to the actual hours worked by husbands and wives is done in two separate standardization processes:

1) Using a common set of hours worked based on the average number of household hours worked in each vingtile of the household earnings distribution of the United States; and

2) Standardizing hours to a common number of hours (2,000 hours per year) based on the proportion of the hours worked by husband and wife to total household hours worked.

The first procedure determines the average total number of household hours worked to be the average number of hours worked in each vingtile of the distribution in the United States in 1991, and then allocates these hours based on the husband and wife's proportion of total household hours. The second procedure assumes 2,000 annual hours would be allocated based on the proportion of average annual hours actually contributed to total household labour supply by husband and wife given in the data for each of the selected countries.

The resulting earnings distributions for each of the standardization procedures represent earnings for comparable households, which have been standardized for differences faced by households in prices, family size, and hours of paid labour across countries. Earnings are presented for each vingtile of the actual earnings distribution and represent the *same composition of families within each vingtile* as in the actual earnings distributions.

The results of the first type of Proportional Hours standardization procedure produces are shown in Figure 7, where hours worked are set equal to the average annual hours worked in the US at each vingtile of the earnings distribution. (See Table A-12). This analysis shows the earnings distributions of Canada, and the Netherlands lie again above the distribution of the US throughout much of the middle portion of the earnings distribution, (from 4th vingtile to the 15th vingtile). The earnings distribution of Finland lies above the US earnings distribution for the bottom 40 percent of households in the distribution. This again suggests that when adjusting household earnings for differences in hours of paid labour in this manner, not only were families at least as well-off in Canada, the Netherlands, Finland and Australia, as they were in the United States, but in fact they were better off .

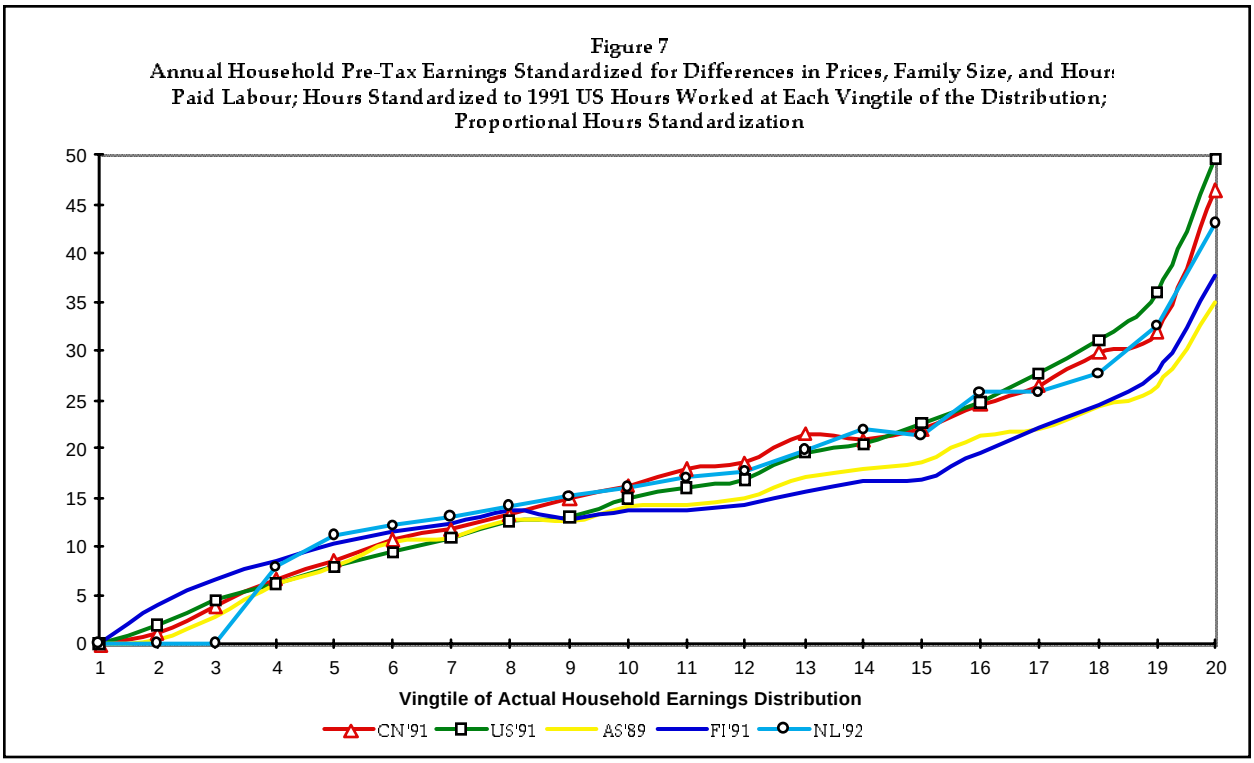
This would suggest that, if couples in countries other than the United States worked the same number of average hours within each vingtile as did households in the United States in 1991, couples in countries such as Canada and the Netherlands would have obtained higher earnings throughout the middle portion of the earnings distribution (households from the 20th vingtile to the 70th vingtile). Also, families in Finland would obtain greater earnings for the bottom 40 percent of the population.

In top of the earnings distribution, however, the top 20 percent of households in the United States are still better off in terms of greater earnings, when comparing across countries, even if households in other countries worked the same number of hours (at each vingtile of the earnings distribution) as did Americans in 1991. Also, in the bottom tail of the distribution, households in the United States show greater earnings than did households in Canada and Australia for the bottom 20 percent of earners. The earnings distribution in Australia lies predominantly below the earnings distribution of the United States except between the 4th vingtile to the 8th vingtile, where Australian earnings are slightly greater than in the United States. The earnings distribution of the Netherlands is pulled down to zero below the 4th vingtile due to the large number of zero earner families in that country.

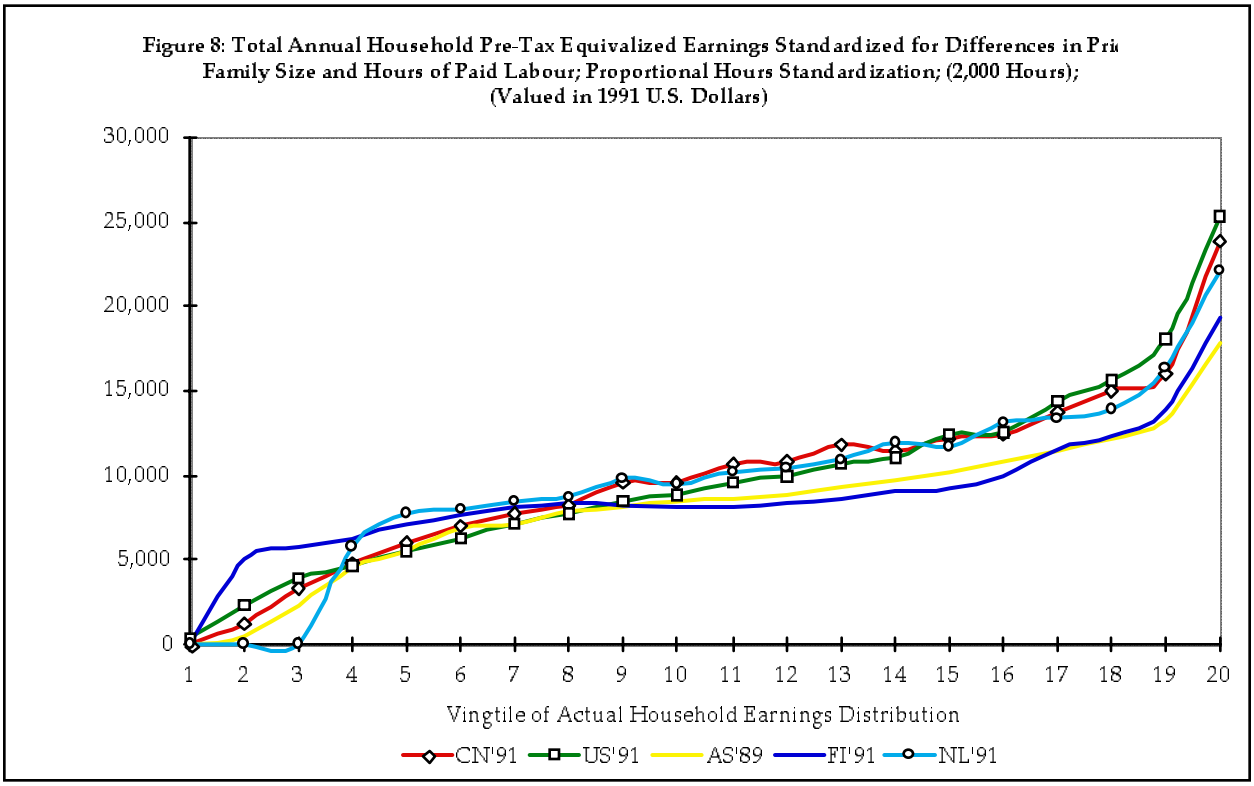
The results of the second type of Proportional Hours Standardization procedure, shown in Figure 8, yields similar results. (See Appendix Table A-13). Once household earnings have been standardized for variations in hours of paid labour, the household earnings distribution of the US no longer lies above the earnings distributions of the four other countries examined throughout much of the earnings distribution. As can be seen in Figure 8, the earnings distributions of Canada, and the Netherlands lie above the distribution of the US throughout much of the middle portion of the earnings distribution, (from 4th vingtile to the 15th vingtile). The earnings distribution of Finland lies above the US earnings distribution for the bottom 40 percent of households in the distribution, when the higher hours worked above of the median of the distribution reduces the standardized earnings distribution back below the US distribution. This would suggest that when adjusting household earnings for differences in hours of paid labour in this manner, not only were families at least as well-off in Canada, the Netherlands, Finland and Australia, (over the portion of the distribution where they lie above

the US earnings distribution), as they were in the United States (for the years of comparison), but in fact they are better off (obtaining a higher standard of living). Comparing households at the top of the earnings distribution, (the highest 15 percent of household earners) across countries, however, households in the US at the top of the distribution still enjoyed higher earnings even when standardized for hours worked. This implies US. couples at the top of the distribution earn a lot of money, given the size of the adjustments for the large number of hours worked.

"Leveling the playing field" across countries, in terms of paid labour time, to facilitate comparisons of household earnings, results in a different ranking of the level of household earnings than that which results from standardizing household earnings for differences in prices and family size only. The earnings distribution of the United States no longer lies above the households earnings distribution of other countries throughout most of the earnings distribution. This result implies that the additional hours worked in United States, (over the hours worked in other countries), does not result in increased economic well-being, as measured by household earnings, when we take account of the value of these hours of paid labour, especially in the middle and lower portions of the earnings distribution. If we adjust household earnings for differences in hours worked, valued at the wages households receive for their labour time (assuming a proportionate combination of husband and wife supply of household labour), we see that the middle and lower portions of the household earnings distribution (from the 4th to the 14th vingtile) in the United States are not achieving higher earnings than comparable households in countries where the average annual household hours worked is much lower (i.e., Finland and the Netherlands). Both types of proportional hours standardization methods resulted in comparable, and higher, levels of earnings in the countries such as Canada, Finland and the Netherlands on the middle and lower portion of the household earnings distribution.



here U.S 1991 hours



here 2,000 hours

6. Conclusion

6.1 Discussion of Results: Canada

While the results in this study are preliminary, they do raise concern about the use of standard monetary measures as comparisons of economic well-being over time periods, without taking into account changes in couples' time devoted to earnings.

In the case of the Canadian analysis, the results of adjusting earnings for trends in time spent working, indicate that levels of economic well-being may not have increased for Canadian families as much as implied by earnings alone. For a vast majority of Canadians, (the bottom 65 percent of the earnings distribution), not only are they no better off than they were twenty years earlier, they are, in fact, worse off, when we take account of the significant increase in household hours spent earning income.

Once hours worked are standardized, the variation in earnings arises solely from wages. This raises some concern that the distribution of wages has not kept pace with standards of living in the bottom half of the earnings distribution. While it is recognized that during the 1980's in Canada, transfer payments (social security, unemployment insurance benefits) played a significant role in alleviating income inequality in Canada (see. Osberg, Erksoy and Phipps, 1994), wage distributions (undistorted by the transfer payments), are often examined in order to understand earnings (from market sources) inequality. The work done in Canada by Juhn, Murphy and Topel (1991) and Kuhn and Robb (1996) indicate that structural changes have caused shifts in the distribution of wages, inducing greater hours worked in order to maintain a standard of living.[36]

In the case of the corss-country analysis, several issues should be highlighted. First, the cross-country comparison of real pre-tax earnings adjusted for only differences in currency, prices and family size found married couples in the US to be the most affluent among the countries examined, (in terms of pre-tax labour earnings for married couples), throughout the earnings distribution.[37] While this result may not seem to be a significant finding of this analysis, it consistent with the findings of Gottschalk and Joyce, (1995), in comparing the level of male earnings across countries.

Second, the preceding analysis resulted in the finding that in the bottom and middle portions of the earnings distribution, the difference in affluence could be partially attributed to differences in hours worked. This analysis attempted to determine to what extent cross country differences in the level of earnings for married couples is due to differences in hours worked. The relative ranking of economic well-being of married couples households across countries depends on

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[36] See also Xu (1996), who used generalized Lorenz (GL) dominance criteria to rank wage distributions over time in Canada using data from the Canadian Labour Market Activity Survey (LMAS) during the period 1986-1990. This analysis showed the wage distributions have improved from 1986 to 1987, in the sense of GL dominance (wage distribution in 1987 shows a higher level and smaller inequality). However, the study showed a similar change did not occur in the period after 1987.

[37] Except at the 9th vingtile, where earnings distribution of Canadian married couples is slightly higher than that of the US.

where families lie in the household earnings distribution. These results suggest the "working poor" are worse off in the US and married couples at the top of the U.S. earnings distribution still enjoyed higher earnings even when we consider the value of the time spent to acquire their earnings. This implies that even if high earner couples in Canada, Australia, Finland or the Netherlands worked as much as the high earnings counterparts in the US, they still would not match their earnings.[38]

Third, the use of substantially different procedures to value a common number of hours, all yield the same result: that smoothing out the "playing field" across countries, in terms of paid labour time, to facilitate comparisons of household earnings, results in a much different ranking of relative affluence among married couples than that which results when using earnings adjusted for differences in prices and family size only.[39] In each procedure used, the earnings distribution of the United States no longer lies above the households earnings distribution of other countries throughout the earnings distribution.

Fourth, there are potential distributional impacts associated with wives spending more time working outside the home since the loss in the value of household production associated with greater female force participation has possible gender implications. Time use studies have shown that women, on average, contribute to a larger share of total household production than men, not only in Canada, but in other countries as well.[40] Whether or not women carry the brunt of the burden of diminished time available to take care of home and child care responsibilities depends on how couples "package" their supply of labour for both work inside and outside the home in response to the emergence of the dual-earner family, as experienced in countries such as Canada, the United States and Finland.[41] More specifically, the results of this study, indicating that the "working poor" were the worst off among the countries examined in the US, (once earnings are adjusted for the variance in time spent working), places the "working poor women" in the US in the worse position of all.

The fifth point which deserves mention concerns putting the above results into the context of prevailing differences in social institutions and policies across countries. Market forces go a long way in explaining the diversity of experiences across countries, but institutions also matter. Cross country comparison of earnings does not allow for a comparison of full consumption potential or the full command over goods and services of families. Hence, the relationship between labour market earnings and "full" family income is less clear due to

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38 This is, of course, assuming couples' labour supply would be similar to that assumed in the procedures used to standardize hours worked.

39 Two other procedures (High Wage Standardization procedure, where the higher wage earner between husband and wife supplies total standardized hours and the Wife as a Second Earner Standardization procedure, where the wife acts as a supplementary earner) were used in previous work and both yielded similar results.

40 For Canada, see the General Social Survey on Time Use, Statistics Canada, 1992. For the results of time use surveys for a selected number of other countries, see "The Measurement of Non-Market Production, OECD Survey Reports, OECD, 1992. See also Phipps (1996), p. 92. Other evidence on gender differences in the use of time across countries which suggest women contribute to a larger share of household responsibilities can be found (Daly, (1996), Witt and Goodale (1981), and Presser (1989)).

41 Husbands and wives may equally share the household work, or perhaps some household work doesn't get done or is contracted out to a third party, or perhaps women put in a "double-work" day and feel the time crunch.

differences in political and social institutions across countries. Among the five countries examined in this study, large differences in social policies and programs play a substantial role in the economic well-being associated with household earnings.[42] Low earner families in the countries such as Canada and the United States face very different income transfer schemes and social policies than is the case for low earnings families in a country such as Finland.

In short, the monetary carrot on the end of the stick which Canadian couples are spending an increasing amount of time chasing, is shrinking if we value our time spent chasing it.

[42] See Phipps (1996) for a comparative cross country review of social policy in five countries, including Finland and Canada. Also, S.B. Kamerman, (1980). The comparative section on social policy is taken from Phipps, 1996. Also, Maureen Baker, (1995).

Figure A-1
Percentage Distribution of Husband-Wife Families by Earning Status of Spouses
1967-1995

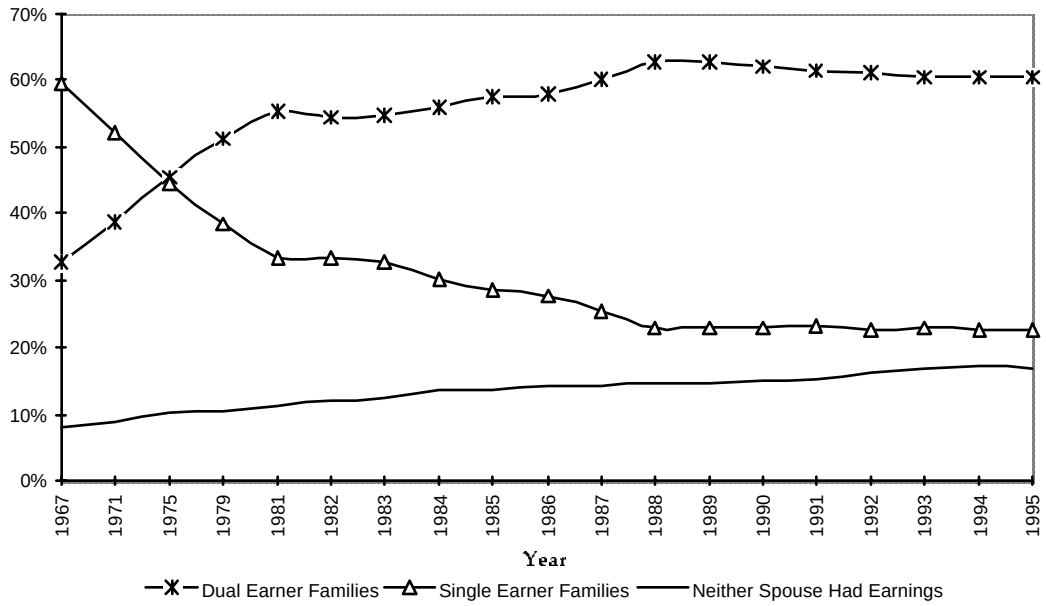

Table A-1
Total Household Annual Hours Worked; Actual Earnings Distribution

Vingtile	CN75	CN87	CN91	CN94
1	542	0	0	0
2	1,333	1,496	1,480	807
3	1,800	2,401	2,161	2,137
4	1,842	2,515	2,325	2,401
5	2,091	2,534	2,549	2,521
6	2,153	2,672	2,665	2,739
7	2,171	2,791	2,734	2,812
8	2,333	2,672	2,751	2,842
9	2,291	2,819	2,744	2,858
10	2,500	2,779	2,894	3,044
11	2,470	2,950	2,855	3,156
12	2,635	2,912	2,997	3,243
13	2,659	3,177	3,121	3,323
14	2,780	3,079	3,272	3,371
15	2,876	3,244	3,349	3,457
16	2,962	3,291	3,431	3,506
17	3,071	3,385	3,499	3,611
18	3,037	3,568	3,581	3,755
19	3,142	3,799	3,825	3,923
20	3,097	3,802	3,864	4,027

Table A-2

Differences in Annual Hours Worked Amoung Advanced OECD Countries, 1994

Country	Annual hours Per Employee, 1994	Employment Population Ratio (Ages 15-64)	Annual Hours Per Adult (Ages 15-64)
United States	*1,780*	*73.2*	*1,303*
Australia	*1,882*	*67*	*1,261*
Canada	*1,719*	*63.8*	*1,097*
Netherlands	*1,395*	*63.7*	*889*
Finland	*1,780*	*60.1*	*1,070*
United Kingdom	1,717	66.5	1,142
New Zealand	1,843	68.2	1,257
Norway	1,415	72.7	1,029
Germany	1,578	62.6	988
France	1,631	59	962
Sweden	1,631	70.3	962
Japan	1,965 (1992)	74.2	1,458

Source: Column 1, OECD Employment Outlook July 1995, Table C.
Column 2, OECD Employment Outlook July 1995, Table A.

Table A-3
Total Household Annual Hours Worked; Actual Earnings Distribution

Vingtile	CN'91	US'91	AS'89	FI'91	NL'91
1	0.00	78.68	0.00	0.00	0.00
2	1,479.69	1,602.38	705.31	63.32	0.00
3	2,160.63	2,294.71	2,552.20	966.79	0.00
4	2,324.94	2,672.82	2,631.72	1,647.08	883.91
5	2,549.23	2,846.12	2,643.49	1,885.54	1,990.86
6	2,664.99	3,036.10	2,572.96	1,976.76	2,072.28
7	2,733.56	3,039.30	2,698.40	2,087.02	2,129.21
8	2,750.76	3,230.23	2,704.13	2,316.23	2,224.65
9	2,744.27	3,100.93	2,817.48	2,619.48	2,114.15
10	2,893.51	3,340.82	2,877.55	2,894.45	2,306.48
11	2,855.15	3,348.44	3,128.86	3,194.54	2,385.64
12	2,996.72	3,391.18	3,188.91	3,429.38	2,499.86
13	3,121.01	3,644.13	3,312.27	3,515.64	2,583.79
14	3,271.59	3,654.35	3,481.50	3,599.76	2,617.62
15	3,348.50	3,621.10	3,563.35	3,678.59	2,863.29
16	3,430.93	3,927.74	3,668.37	3,715.73	2,746.17
17	3,499.30	3,844.15	3,733.78	3,646.70	3,021.96
18	3,580.73	3,963.28	3,894.31	3,777.17	3,080.20
19	3,825.37	3,986.24	3,999.60	3,728.82	2,894.08
20	3,863.92	3,898.68	4,055.13	3,726.91	3,070.40
Average	2,804.74	3,126.07	2,911.47	2,623.50	2,074.23

Table A-4

Sample Selection Criteria, LIS Data, Canada; For Selected Years

	Canada '75		Canada '87		Canada '91		Canada '94	
Total Sample:	26,247		10,351		21,566		32,653	
Single Family Households	26,247	100.00%	8,830	85.31%	18,402	85.33%	27,239	83.42%
Households in Multi-Family HH.	0	0.00%	475	4.59%	999	4.63%	3,403	10.42%
Families in Multi-Family HH.	0	0.00%	1,046	10.11%	999	4.63%	843	2.58%
Other Family Classification	0	0.00%	0	0.00%	1,166	5.41%	1,123	3.44%
Missing	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	26,247	100.00%	10,351	100.00%	21,566	100.00%	32,653	100.00%
Check hours = 1	26,200	99.82%	9,312	89.96%	18,837	87.35%	17,367	53.19%
Check hours = 0	47	0.18%	403	3.89%	790	3.66%	675	2.07%
Missing Values	0	0.00%	636	6.14%	1,939	8.99%	14,611	44.75%
Total	26,247	100.00%	10,351	100.00%	21,566	100.00%	32,653	100.00%
Head Aged 21 to 65	21,336	81.29%	8,605	83.13%	17,634	81.77%	26,459	81.03%
Head Not Aged 21 to 66	4,911	18.71%	1,746	16.87%	3,932	18.23%	6,194	18.97%
Missing Values	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	26,247	100.00%	10,351	100.00%	21,566	100.00%	32,653	100.00%
Disposable Income □ Zero	26,210	99.86%	10,315	99.65%	21,480	99.60%	32,565	99.73%
Disposable Income Less Than Zero	37	0.14%	36	0.35%	86	0.40%	88	0.27%
Missing	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	26,247	100.00%	10,351	100.00%	21,566	100.00%	32,653	100.00%
Spouse Present	16,816	64.07%	6,104	58.97%	12,052	55.88%	19,089	58.46%
Spouse Not Present	9,431	35.93%	4,247	41.03%	9,514	44.12%	13,564	41.54%
Missing Value	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	26,247	100.00%	10,351	100.00%	21,566	100.00%	32,653	100.00%
Male Household Head	20,632	78.61%	7,895	76.27%	16,068	74.50%	24,844	76.09%
Female Household Head	5,615	21.39%	2,455	23.72%	5,498	25.50%	7,809	23.91%
Missing	0	0.00%	1	0.01%	0	0.00%	0	0.00%
Total	26,247	100.00%	10,351	100.00%	21,566	100.00%	32,653	100.00%
Zero Earnings; HH Head			3,203	30.94%	11,269	52.25%	11,992	36.73%
Positive Earnings; HH			7,148	69.06%	10,297	47.75%	20,661	63.27%
Negative Earnings; HH			0	0.00%	0	0.00%	0	0.00%
Missing			0	0.00%	0	0.00%	0	0.00%
Total			10,351	100.00%	21,566	100.00%	32,653	100.00%
Zero Earnings; Spouse			6,692	64.65%	13,991	64.87%	7,533	23.07%
Positive Earnings; Spouse			3,658	35.34%	7,575	35.13%	11,556	35.39%
Negative Earnings; Spouse			0	0.00%	0	0.00%	0	0.00%
Missing			1	0.01%	0	0.00%	13,564	41.54%
Total			10,351	100.00%	21,566	100.00%	32,653	100.00%

*Note: Earnings in 1975 data file are not split into earnings of head and spouse; earnings are total earnings of household. This data file contained negative household earnings, (9.03% of the sample files contained negative total earnings).

Table A-5

Sources of Data; LIS Country Data Files

Country	Original Data Set	Survey Year	Observation Year
Australia	Income and Housing Survey	1990	1989
Canada	Survey of Consumer finances	1992	1991
Netherlands	Survey of Income and Program Users	1992	1991
United States	March Current Population Survey	1992	1991
Finland	Income and Expenditure Survey	1992	1991

Source: de Tombeur, Caroline et al. (1993), "Luxembourg Income Study (LIS): Information Guide", LIS CEPS Working Paper No. 7.

Table A-6

Cross comparison of Weighted Sample Affected by Sample Selection Criteria

	Australia		US		Canada		NL		Finland	
	1989	Percentage	1991	Percentage	1991	Percentage	1991	Percentage	1991	Percentage
Total Sample:	16,244		15,910		21,566		4,326		11,740	
Single Family Households	12,359	76.1%	13,979	87.9%	18,402	85.3%	4,326	100.0%	11,740	100.0%
Households in Multi-Family HH.	803	4.9%	605	3.8%	999	4.6%	0	0.0%	0	0.0%
Families in Multi-Family HH.	1,776	10.9%	1,326	8.3%	999	4.6%	0	0.0%	0	0.0%
Other Family Classification	0	0.0%	0	0.0%	1,166	5.4%	0	0.0%	0	0.0%
Missing	1,306	8.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%
Hours □ zero and Earnings □ zero	13,166	81.1%	15,234	95.7%	18,837	87.3%	2,724	63.0%	10,678	91.0%
Not Hours □ 0 and Earnings □ 0	951	5.9%	675	4.2%	790	3.7%	1,602	37.0%	4	0.0%
Missing Values	2,126	13.1%	1	0.0%	1,939	9.0%	0	0.0%	1,058	9.0%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%
Head Aged 21 to 65	11,731	72.2%	12,587	79.1%	17,634	81.8%	3,396	78.5%	9,352	79.7%
Head Not Aged 21 to 66	3,205	19.7%	3,323	20.9%	3,932	18.2%	930	21.5%	2,388	20.3%
Missing Values	1,308	8.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%
Disposable Income > Zero	14,859	91.5%	15,781	99.2%	21,480	99.6%	4,277	98.9%	11,735	100.0%
Disposable Income < Zero	79	0.5%	128	0.8%	86	0.4%	49	1.1%	5	0.0%
Missing	1,306	8.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%
Spouse Present	8,823	54.3%	8,616	54.2%	12,052	55.9%	2,732	63.2%	6,378	54.3%
Spouse Not Present	6,113	37.6%	7,290	45.8%	9,514	44.1%	1,594	36.8%	5,362	45.7%
Missing Value	1,308	8.1%	5	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%
Male Household Head	11,345	69.8%	11,363	71.4%	16,068	74.5%	3,304	76.4%	8,267	70.4%
Female Household Head	3,591	22.1%	4,547	28.6%	5,498	25.5%	1,022	23.6%	3,473	29.6%
Missing	1,308	8.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%
Zero Earnings; Household Head	7,745	47.7%	6,460	40.6%	11,269	52.3%	2,205	51.0%	5,837	49.7%
Positive Earnings; Household Head	8,499	52.3%	9,450	59.4%	10,297	47.7%	2,121	49.0%	5,903	50.3%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%
Zero Earnings; Spouse	10,445	64.3%	10,759	67.6%	13,991	64.9%	1,449	33.5%	6,992	59.6%
Positive Earnings; Spouse	5,799	35.7%	5,150	32.4%	7,575	35.1%	2,868	66.3%	4,748	40.4%
Missing Values	0	0.0%	0	0.0%	0	0.0%	9	0.2%	0	0.0%
Total	16,244	100.0%	15,910	100.0%	21,566	100.0%	4,326	100.0%	11,740	100.0%

Table A-7

Reported and Computed Variables Used in the Distribution of Annual Earnings and Average Hours Worked

Variable ID	Reported/Computed	Variable Description
V39	Reported	Gross annual pre-tax earnings, household head.
V41	Reported	Gross annual pre-tax earnings, spouse
Hrshd	Reported	Average number of hours worked per week, household head
Hrssp	Reported	Average number of hours worked per week, spouse
Weekhdft	Reported	Total number of weeks worked full-time per year, household head
Weekhdpt	Reported	Total number of weeks worked part-time per year, Household head
Weekspft	Reported	Total number of weeks worked full-time per year, spouse
Weeksppt	Reported	Total number of weeks worked part-time per year, spouse
Wktothd	Computed	Total number of weeks worked (ft + pt) per year, household head
Wktotsp	Computed	Total number of weeks worked (ft + pt) per year, spouse
Hrstothd	Computed	Total number of hours worked per year, (Wktothd X Hrstothd), HH head
Hrstotsp	Computed	Total number of hours worked per year, (Wktotsp X Hrstotsp), Spouse

Table A-8
Annual Household Pre-Tax Earnings Standardized For Prices and Family Size;
Actual Earnings Distribution; Canada 1975-1994; (Valued in 1994 Dollars)

Vingtile	CN75	CN87	CN91	CN94
1	2,150	0	0	0
2	5,340	31	138	6
3	7,482	1,764	2,233	1,825
4	9,284	3,959	4,591	4,640
5	10,744	6,035	6,926	7,179
6	11,875	8,444	9,116	9,774
7	13,177	10,768	11,108	11,980
8	14,615	12,111	12,902	13,789
9	15,127	13,465	14,028	15,429
10	16,204	15,687	16,317	17,328
11	17,500	16,270	17,432	19,140
12	18,441	18,457	19,323	20,669
13	19,572	19,364	20,619	22,252
14	20,629	20,795	23,106	24,098
15	22,234	22,641	24,001	26,870
16	23,566	24,960	25,712	27,963
17	25,128	27,846	28,666	31,189
18	27,391	30,006	32,480	34,754
19	30,475	36,125	38,230	39,919
20	42,390	49,359	58,521	54,566

Table A-9
Annual Household Earnings Standardized For Differences in Prices, Family size, and Hours of Paid Labour; Hours Worked Standardized to 1975 Hours Worked in Each Vingtile of the Earnings Distribution
Proportional Hours Standardization; Canada; 1975-1994, (Valued in 1994 Dollars)

Vingtile	CN75	CN87	CN91	CN94
1	616	0	0	0
2	3,915	1,008	1,012	809
3	6,608	3,125	3,671	3,303
4	8,507	4,732	5,563	5,407
5	10,344	7,645	7,801	8,133
6	11,364	9,028	9,313	9,440
7	12,806	9,738	10,376	10,639
8	13,929	12,075	11,937	12,671
9	14,867	12,886	13,606	13,846
10	16,003	14,661	15,003	15,362
11	17,087	15,514	16,448	15,861
12	18,330	17,270	17,795	17,665
13	19,248	17,519	19,426	18,744
14	20,616	19,645	19,779	21,307
15	21,949	21,060	21,729	22,422
16	23,435	24,031	22,869	24,759
17	25,042	25,968	26,178	27,123
18	27,420	27,142	28,341	29,087
19	30,262	30,196	31,225	32,678
20	42,571	40,851	45,872	42,627

Table A-10
Annual Household Earnings Standardized for Differences in Prices, Family Size and and Hours of Paid Labour; Proportional Hours Standardization; (2,000 Hours)
Canada 1975-1994 (Valued in 1994 Dollars)

Vingtile	CN75	CN87	CN91	CN94
1	2,273	0	0	0
2	5,874	1,512	1,519	14
3	7,341	3,471	4,078	1,708
4	9,235	5,137	6,039	3,865
5	9,893	7,311	7,461	5,695
6	10,558	8,387	8,652	7,138
7	11,800	8,973	9,560	8,522
8	11,943	10,353	10,236	9,702
9	12,978	11,249	11,878	10,796
10	12,802	11,728	12,002	11,386
11	13,838	12,564	13,320	12,130
12	13,913	13,108	13,506	12,746
13	14,476	13,176	14,611	13,394
14	14,832	14,133	14,229	14,298
15	15,263	14,644	15,110	15,545
16	15,825	16,227	15,442	15,951
17	16,310	16,913	17,050	17,276
18	18,057	17,875	18,664	18,510
19	19,261	19,220	19,874	20,350
20	27,489	26,379	29,621	27,103