# Think Inequality is Higher in North America than in Europe? Think Again.

The Occupy Wall Street movement has brought the issue of economic inequality back to the social and political forefront. Most studies suggest that earnings inequality is much greater in North America than in Europe, but is this really the case? As recent research by CIBC Fellow Audra Bowlus and co-author Jean-Marc Robin shows, the answer depends on how earnings inequality is defined and the measures used to investigate it.

Previous studies on earnings inequality have typically relied on earnings data from a single year to measure inequality. Yet, measures of inequality based on a single year of earnings may not reflect lifetime inequality due to *earnings mobility* and *employment risk*. (See

## Box 1 - Key Definitions

- **Earnings mobility** reflects an individual's movements within the earnings distribution over time.

- **Employment risk** represents the risk that an individual may endure a spell of unemployment. It accounts for the probability of entering into unemployment from employment at any particular earnings level, the duration of the unemployment, and the possible earnings levels following re-employment.

Box 1 for definitions of these terms.) In any given year, two individuals may have very different earnings even though they have similar lifetime earnings. This is because earnings tend to bounce up and down over time for any given individual. So, in any given year, individuals may have uncharacteristically high or low earnings relative to their lifetime average. These short-term fluctuations inflate single-year measures of inequality that compare earnings across individuals in any given year, but they tend to average out over a worker's lifetime. As such, they generally have little impact on lifetime inequality measures. Measures of inequality based on a single year of earnings will, therefore, be high relative to lifetime measures of inequality in countries characterized by considerable short-term variability in earnings.

If individuals are able to borrow and save as needed, then a lifetime earnings-based measure of inequality should give a more accurate picture of how economic and social welfare differs between individuals within countries. It is, therefore, important to develop and estimate meaningful measures of inequality that account for differences in lifetime earnings rather than relying only on differences in earnings during any single year. This distinction turns out to be important for cross-country inequality comparisons, since countries differ in terms of earnings mobility and employment risk.
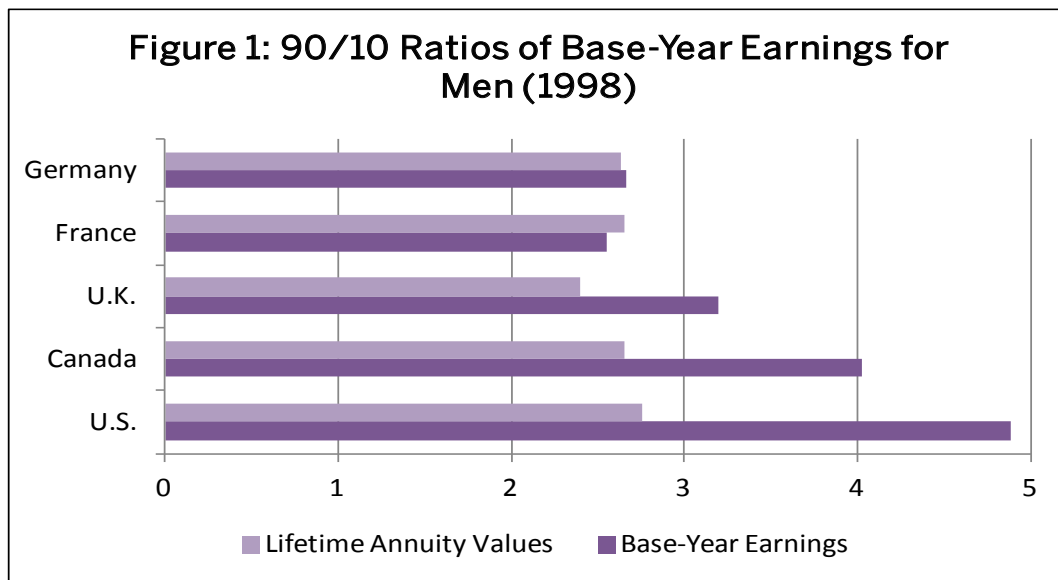
In "An International Comparison of

Lifetime Inequality: How Continental Europe Resembles North America" (CIBC Centre Working Paper 2011-6), Bowlus and Robin develop a new methodology for investigating and comparing lifetime earnings inequality across countries. Focusing on North America and Europe, they show that lifetime inequality is much smaller in North America than single year earnings comparisons would suggest.

**Figure 1: 90/10 Ratios of Base-Year Earnings for Men (1998)**



Lifetime Annuity Values ■ Base-Year Earnings

In fact, due to important cross-country differences in earnings mobility and employment risk, lifetime inequality in North America is very similar to that of Europe.

Previous investigations of lifetime earnings inequality have generally relied on long panel data sets that track the same sample of individuals over a period of many years. The lack of lengthy panels for many countries has led most researchers to settle for cross-country comparisons based only on measures of current earnings inequality. Importantly, Bowlus and Robin develop a new statistical approach to compute lifetime earnings measures using relatively short panel data sets. The reduced data requirements of their methodology allow for analysis and comparison of lifetime inequality across more countries and a broader range of time periods.

Bowlus and Robin's analysis accounts for a number of (often overlooked) factors important for properly comparing lifetime earnings inequality across countries. First, they isolate changes in earnings related exclusively to business cycles, which can then be reduced or eliminated from the analysis

to focus on more structural differences across countries. Second, their analysis accounts for asymmetry in earnings dynamics due to the fact that year-to-year movements in earnings depend on the current level of earnings. For example, very low earners in one year may be more likely to see their earnings increase than decrease the following year, while the opposite may be true of those with particularly high earnings in any given year. Third, they account for employment risk, in addition to earnings mobility, in measuring lifetime earnings.

The authors begin their analysis by estimating a statistical model of earnings mobility and employment risk for each country using panel data covering 3-7 years on working-age individuals. (See Box 2 for details of their methodology.) Based on this statistical model, they simulate remaining lifetime earnings paths for each individual, incorporating country-specific characteristics such as average retirement ages and unemployment insurance systems. In order to compare individuals at different points in their lives, simulated lifetime earnings values are converted to annuity values. (Roughly speaking, annuity values

represent a measure of average annual earnings over the rest of an individual's career.)

As is well known, current earnings inequality is much higher in North America than in Continental Europe. Consider the 90/10 ratio, a common inequality measure in which earnings of high earners (90th percentile) are divided by earnings of low earners (10th percentile). Figure 1 shows that for men in 1998, high earners in the U.S. earned nearly five times as much as low earners, while in Canada, this ratio was four. In contrast, France and Germany showed much lower current earnings inequality among men, with high earners receiving just over 2.5 times that of low earners.

Using their new methodology, Bowlus and Robin find that the lifetime inequality picture looks much different. When earnings mobility and employment risk are taken into account, all five countries show a similar level of lifetime earnings inequality, where here the 90/10 ratio is based on the 90th and 10th percentiles of lifetime annuity values, rather than single-year earnings. The U.S. is still the most unequal, with a ratio of 2.76.

However, this ratio is markedly smaller than the ratio for the U.S. single-year measure and is only slightly higher than the lifetime inequality ratios for Canada, France, and Germany, all approximately 2.65. Lifetime earnings inequality is lower in the U.K., with a ratio of 2.4.

Differences between current and lifetime earnings inequality are due in part to differences in earnings mobility. Americans tend to experience substantial year-to-year variation in earnings relative to the French. For reasons discussed earlier, this higher U.S. mobility exacerbates single-year measures of inequality, but has little impact on lifetime inequality. Low levels of mobility in France imply that differences in current earnings tend to be persistent and translate into differences in lifetime earnings.

The inclusion of employment risk also factors into cross-country comparisons of inequality based on single-year vs. lifetime earnings measures due to important differences in unemployment patterns. Individuals across the full earnings distribution in Canada and the U.S. are subject to a greater risk of unemployment compared to those in France and Germany, where the risk is primarily for those in the lower part of the distribution. Despite the greater risk of unemployment, North Americans face much shorter unemployment durations and have a much greater likelihood of transitioning to higher earnings levels following re-employment than their Continental European counterparts. As a result, employment risk is an equalizing factor in North America and a non-equalizing factor in Continental Europe in terms of its impact on lifetime earnings inequality.

It is important to consider the role of earnings mobility and the distinction between current and lifetime earnings inequality when evaluating social and economic policy. Well-meaning efforts to reduce current earnings inequality may have little impact on lifetime inequality if they distort work incentives and lead to reductions in earnings mobility. At the same time, one should not ignore current inequality entirely, since some individuals may have difficulty saving or borrowing to smooth out movements in earnings. Ultimately, governments must consider policy impacts on both lifetime and single-year inequality measures.

The results of this study suggest that employment risk affects lifetime earnings differently in North America and Europe. Continental Europe is known to have stronger employment protection policies and more generous unemployment insurance programs. These policies appear to disproportionately protect high earners and result in longer unemployment durations for low earners, all of which increase lifetime earnings inequality. Policy changes aimed at helping unemployed workers find employment more quickly and/or reductions in employment regulation may reduce lifetime earnings inequality in Europe.

## Box 2 - Methodology Details

**Removing the business cycle:** Earnings variation related to the business cycle is isolated from individual earnings variation by regressing log earnings on education-specific time dummies. Analysis is then conducted on earnings levels from which the business cycle variation has been removed.

**Estimating earnings dynamics over the lifecycle:** Individuals' earnings within each country are separated into deciles. The authors estimate a "transition matrix" representing the probability of moving to a different earnings decile in the subsequent period from an individual's previous earnings decile, given the individual's age and education. Unemployment is included as a state in the transition matrix in order to incorporate employment risk into the possible earnings paths.

**Simulating earnings:** The authors start with an individual's current earnings and employment state. A sequence of transitions is then randomly drawn from that point through expected retirement, based on personal characteristics of that individual, to simulate how the individual's earnings will change through retirement. If the individual's simulated path includes a spell of unemployment, unemployment income is included in the earnings measure for that year. Unemployment income is calculated by multiplying a country-specific replacement rate by the previous period earnings if the individual was employed in the previous period and by a country-specific minimum income level if the individual was unemployed in the previous period.

**Annuity values:** Discounted sums of each individual's simulated future earnings stream are converted to annuity values using an annual interest rate of 5% in order to allow for earnings comparisons across individuals of different ages.

## References

Bowlus, Audra J., and Jean-Marc Robin, "An International Comparison of Lifetime Inequality: How Continental Europe Resembles North America," CIBC Centre for Human Capital & Productivity Working Paper 2011-6, 2011.

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