0- INTRODUCTION

Plan

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2. Sources of Evidence in Labour Economics

3. Methods for the Identification of Causal Effects
0.1 Subject Matter

- The traditional focus of inquiry of labour economics is the labour market, i.e. workers and their wages
  - Participation, hours of work, jobs, unemployment
  - Wages, productivity and performance pay

- Industrial Relations is a wider interdisciplinary field that studies the employment relationship
  - Historically (circa 1920), the relationship between the employer and its unionized workforce was its main focus
  - As most employment is no longer industrial, and most workers are no longer unionized, that focus has shifted towards human resource management

➢ Why labour economics (workers and their wages) is important for the study of the economy as whole?
• As in the time of Adam Smith (1776), one of the great economic issues relates to differences in the economic performance of capitalist economies.
  ▪ In the 1980s, the great success of Japan was thought to reside in its labour practices.
  ▪ From the 1990s onwards, differences between the economic performance of European Union and U.S. economic performance were thought to be linked to more market-oriented labour institutions and a weaker welfare state in the United States.

• How technological change and trade affects workers, including the likelihood and costs of displacement, the role of offshoring in reducing demand for skilled as well as unskilled labor, and the impact of trade on earnings inequality

• Concern over rising wage and income inequality constitute perennial labour topics that have gained in prominence with the 2011 “Occupy Movement”

• In 2014, Thomas Piketty’s book “Capital in the 21st century”, which extended his previous analysis of income inequality to wealth inequality, was a unprecedented bestseller for economics book.
The focus of labour economics has recently extended to related issues, for example

- the pre-market acquisition of human capital, i.e. education, schooling, including issues about school quality
- the impact of immigration on the labour market, including issues about network and peer effects
- the participation of women to the labour market, including issues such as marriage and fertility decisions
- the equality of opportunity for various ethnic/racial/gender groups

What other issues might be linked?
- Alternative employment, such as crime
- Alternative compensation, such as happiness and well-being
Some stylized facts: Are things changing?

- Does the level of labor market participation of women compare to that of men? Is the gender wage gap closing?

- Is the unemployment rate back to pre-recession level?

- How about earnings and wages, does it pay to get a university degree? If so, what kind?

- What about income and wage inequality? Are the rich getting richer and the poor getting poorer? Is globalization implicated in the changes?
Women's labor force participation rates, selected countries, 1970–2009

16-65 year olds

What is the ratio of women’s to men’s earnings on average in Canada?

- Between 1984-2008, the gender wage gap narrowed by 9.6 percentage points or in relative terms, by 13%.

Unemployment rates, 25 years and older, by educational attainment, October 2008–October 2014, seasonally adjusted

Click legend items to change data display. Hover over chart to view data.
Sources: Statistics Canada; U.S. Bureau of Labor Statistics. 2014 Budget. Conceptual differences raise the Canadian unemployment rate relative to the U.S. rate. In particular, Statistics Canada considers as unemployed those passively looking for work (e.g. reading want ads) as well as those who will begin work in the near future, while the U.S. Bureau of Labor Statistics does not include either group in the labour force. In addition, the Canadian methodology includes 15-year-olds (who have a higher-than-average unemployment rate), while the U.S. does not.
Over the past 20 years, top incomes in the US have soared.

FIGURE 1
The Top Decile Income Share in the United States, 1917-2007

Source: Piketty and Saez (2003), series updated to 2007. Income is defined as market income including realized capital gains (excludes government transfers). In 2007, top decile includes all families with annual income above $109,600.
Top 1% has gained more than top 10%
Increases in top incomes in other countries too!

Figure 7A. Top 1% share: English Speaking countries (U-shaped), 1910-2005
But not all countries!

Figure 7B. Top 1% Share: Middle Europe and Japan (L-shaped), 1900-2005
0.2 Sources of Evidence:

A. Traditionally Used Micro-Data Sets

- Censuses (Canada, since 1910, every five years since 1985, until 2006; US decennial since 1840, until 2010)


- Panel Data (Longitudinal) (Canada: SLID since 1993, US: PSID since late 1960s, NLSY79, NLSY97, etc.

- Specialized surveys (Educational Surveys, Canada: National Graduate Surveys, YITS, US: NELS, Early Childhood Longitudinal Study, etc.)
The relative strengths and weaknesses of these different data sets have to do with

- sample size,
- key variables and unique variables available,
- time span and frequency, consistency over time,
- cross-sectional, longitudinal, cohort-specific
- user friendliness,
- measurement error
- panel data, dynamic models, fixed effects
B. Newer Sources of Data

- Administrative Data Bases (Canada, LAD, LEAP; US, Social Security Data-IRS)
- Sweden: Swedish Level of Living Surveys (LNU); Norwegian, Danish administrative data set on entire population
- Employer-employee linked data set (Canada: WES; Germany: LIAB (Linked Employer–Employee Data from the IAB); US: Longitudinal Employer-Employee Data (LEED); Italy: Veneto Work History data, etc.
- “Big Data”, scanner data, data from user sites: oDesk.com, Google, etc.
0.3 Methods for the Identification of Causal Effects

Economics is to a large extent an observational science, like say Meteorology, but there are some

- Randomized Experiments
  - Self-Sufficiency Project (SSP) runned by government agencies

- Field Experiments
Laboratory Experiments (meat and potatoes of Psychology)

These are informative, but often small scale (because of costs) and offer variable scope for generalization
  - Rise the issue of external validity
  - Rise the issue of importance of question addressed

Back to observational data, what about naïve regression analysis (i.e control for confounding variables)?
- Controlling for innate ability may reduce the upward bias in returns to schooling if higher ability individuals become more schooled
- Reduces omitted variable bias, but by how much???
- Still suffer from reverse causality problem
In the absence of a true experimental design, more econometrics that appeal to a clear source of identification (research design) can help.

Quasi-natural experiments: differences-in-differences estimation

Instrumental Variables

Regression Discontinuity Methods
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- Quasi-natural experiments: differences-in-differences estimation

- Instrumental Variables

- Regression Discontinuity Methods
• Structural estimation attempts to recover the primitives of economic theory (parameters determining preferences or technology)
  o e.g. estimates of “the” elasticity of labour supply
  o can be added to a natural or field experiment to analyze the impact of changing the parameters of the policy experiment


Causal Inference in Economics

- Goal is to determine the effects of particular interventions on policies, or to estimate features of the behavioral relationships suggested by economic theory.


- There are a few challenges in experimental or quasi-experiment research:
  - Sampling uncertainty, the fact that inferences are drawn from a particular data sample rather than the entire population.
  - Presumes that a clear counterfactual outcome can be agreed upon (counter-example: which non-unionized wage is appropriate?)
  - A more important difficulty is that there is no data on counterfactual states of the world.
• Letting $D_j$ be a dummy variable equal to 1 when an observation unit is treated and to 0 when it is not, the observed outcome for unit $j$ can be written as

$$Y_j = Y_{0j} (1 - D_j) + Y_{1j} D_j$$

• It is assumed that an observed outcome depends only on treatment to which unit $j$ is assigned and not on the allocation of other units. This assumption is called stable-unit-treatment-value assumption (SUTVA).

• Thus we cannot hope to observe $Y_{1j} - Y_{0j}$ for a particular unit $j$, which the true causal effect. For each unit, the comparison of the potential outcome under treatment and the potential outcome under control.

• We may observe the average difference in the potential outcomes as the average causal effect or average treatment effect:

$$ATE = E[Y_{1j} - Y_{0j}] = E[Y_{1j} ] - E[Y_{0j} ]$$

• Other possible average causal effects can be defined, such as the effect of treatment on the treated:

$$ATET = E[Y_{1j} - Y_{0j} \mid D_j = 1] = E[Y_{1j} \mid D_j = 1] - E[Y_{0j} \mid D_j = 1]$$
A comparison of the observation units that are treated and non-treated gives

\[
E[Y_j \mid D_j = 1] - E[Y_j \mid D_j = 0] = E[Y_{1j} \mid D_j = 1] - E[Y_{0j} \mid D_j = 0] \\
= E[Y_{1j} \mid D_j = 1] - E[Y_{0j} \mid D_j = 1] + E[Y_{0j} \mid D_j = 1] - E[Y_{0j} \mid D_j = 0] \\
= E[Y_{1j} - Y_{0j} \mid D_j = 1] + \{ E[Y_{0j} \mid D_j = 1] - E[Y_{0j} \mid D_j = 0] \},
\]

where the last terms in braces capture the difference in the average outcomes between treated and non-treated units in the absence of treatment, it is called the selection bias.

If the treatment is randomly assigned, \( Y_1, Y_0 \perp D \) the assignment to treatment is independent of potential outcomes, the assignment is also said to be ignorable. The selection bias will vanish and we can expect the treatment-control difference to provide an unbiased estimate of the average treatment effect.

If the treatment is not randomly assigned, the comparison of treated and non-treated units will contain a term not due to treatment.

In the absence of a true experimental design (randomized data), a quasi-experimental method may be the best alternative.