The Distribution of Earnings Losses: Evidence from Displaced Worker Surveys 1994-2010

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Motivation and Purpose

- In 2010, 6.9 million U.S. workers experienced not-for cause displacement from jobs where they had been employed for at least 3 years.
- Such involuntary job loss is associated with large and persistent earnings losses.
- Prior studies estimate average earnings losses experienced by displaced workers to be between 10-40%, using least squares regression models.
- However, little emphasis has been placed on the earnings loss of the typical displaced worker or on the overall distribution of losses.
- Using Current Population Survey data on displaced workers from 1994-2010, I reevaluate the effects of job displacement and provide:
  - An updated characterization of the distribution of earnings losses
  - More sophisticated treatment of the relationship between earnings losses and factors such as job tenure
  - New evidence on relationship between pre- and post-displacement occupations.

Data

- I use data from the Displaced Workers Supplements (DWS) to Current Population Survey (CPS) for the period 1994-2010.
- It’s a biannual survey that documents involuntary job loss of workers:
  - aged 20-64 years
  - over the preceding 3 years
- I focus on workers displaced from full-time jobs.

Sample Characteristics by Survey Year

Displaced workers comprised of about 3% of the labor force in 2010, almost twice the proportion in 1994. The number of displaced workers tends to go up during recessions:

- 5.5 million in the 2004 survey, covering the TT bubble of 2001-03.
- 6.9 million in the 2010 survey, covering the financial crisis of 2007-09.

About 25% of these workers have at least a college degree in each of the survey years.

The share of displaced workers re-employed on the survey date ranges from 66% to 75%.

This fell to 50% in Great Recession.

Quantile Regression Analysis

Allows for a more complete characterization of post-displacement earnings distribution than is possible using Ordinary Least Squares (OLS).

For a sample of size denoted by \((y_i, x_i), i = 1, ..., n\), quantile regression (QR) model assumes the relationship between the dependent variable, \(y_i\), and the \(K \times 1\) vector of regressors, \(x_i\), to be as follows:

\[
Pr(y_i \leq t|x_i) = F_{\theta}(x_i | \epsilon) = \Phi(t | \mu_i, \sigma_i)
\]

(\(i = 1, ..., n\))

where \(\theta\) is \((0,1)\) and \(F_{\theta}(x_i | \epsilon)\) denotes the conditional quantile of \(y_i\) given \(x_i\).

\(\hat{\theta}_n\) is the estimator for \(\theta\), solves the optimization problem:

\[
\min c_n \sum |x_i \hat{\theta}_n | \epsilon_i \geq 0
\]

Where \(\epsilon_i = \min \{0, |y_i - \hat{\theta}_n \hat{\theta}_n | \}

Estimated coefficient vector \(\hat{\theta}_n\) measures the effect of the corresponding regressor in \(x_i\) on \(y_i\) at the \(\psi\)th quantile of \(y_i\).

Average Loss versus Loss of Typical Worker

- Average earnings loss predicted using OLS is 28%.
- Earnings loss of a typical (both skilled) worker is 20%, sizeable but just 71.4% as large.
- Additional loss in earnings among occupation switchers averages 9.4%.
- Typical worker who switches occupations experiences a loss of 5.8%, just 61.7% as large.
- Each additional year of pre-displacement job tenure is associated with an additional average loss in earnings of 1%.
- Typical worker experiences a loss of just 0.7% per year.

New Evidence on Pre- and Post-Displacement Job Skill Level

- I use Autor and Dorn (2013) measure of occupational skill level.
- Compare post-displacement (vertical axis) and pre-displacement skill levels.
- Workers displaced from least (most) skilled jobs tend to find jobs post-displacement that are more (less) skilled than the one they left.
- Workers in the middle of the skill distribution tend to move towards the median level of skills.

Conclusions

- Focus on OLS to estimate post-displacement losses provides an incomplete picture of the experience of displaced workers.
- QR model is helpful in describing the experience of a typical worker, which is significantly different from the average worker.
- Post-displacement employment and earnings also differ by the skill level of the pre-displacement job.
- Negative effect of displacement was more severe at the top-most skill quartile.