# Firms and Workers: Industry Instability and Employee Transitions

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# Contribution & Novelty

Question: How does industry instability affect worker employment outcomes?

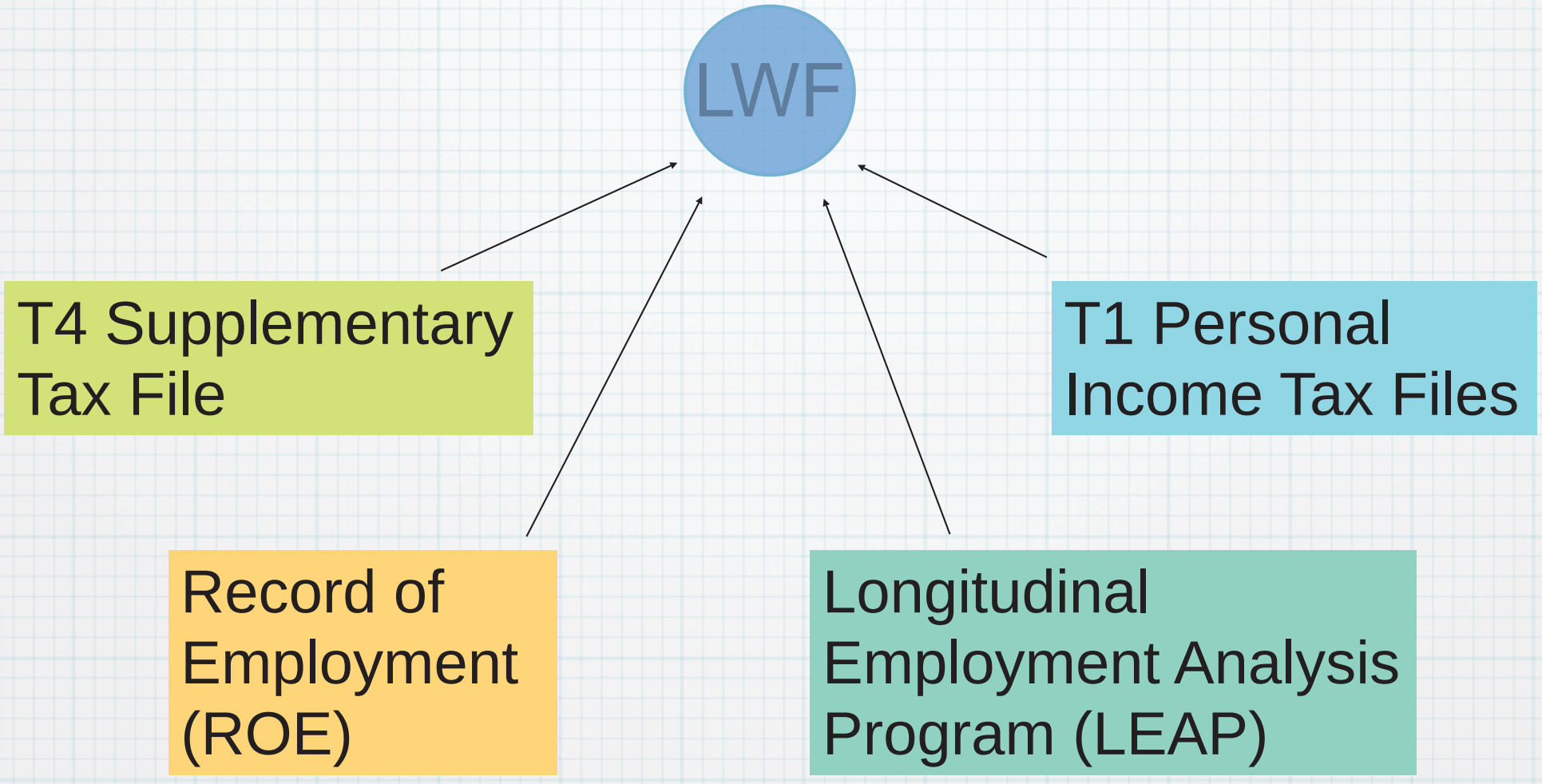
- Detailed information about reasons for separations.
  - Permanent versus temporary separations.
  - Involuntary versus voluntary.

  $\rightarrow$ permanent involuntary separations (firm layoffs).
- Longitudinal data (1992-2008) $\rightarrow$ Wage analysis.
  $\rightarrow$ Look at wage growth for workers who experience a permanent involuntary separations but find a new job.
- Larger set of demographic and economic variables.

# Related Literature

1. Occupation-specificity:
   Kamburov and Manovskii (REStud, 2009).
2. Firm characteristics:
   Abowd, Kramarz and Margolis (ECTA, 1999) - Firm versus Worker characteristics.
   Haltiwanger, Jarmin and Miranda (NBER, 2010) - Firm Growth.
3. Industry Instability:
   Quintin and Stevens (2005) - industry exit rates.
   Dinlersoz, Hyatt and Nguyen (2012) - life-cycle of plants.

# Longitudinal Worker File



# LWF Sample

- 10% random sample of Canadian tax-filers.
- Annual: 1992 - 2008.
- 4-digit NAICS codes are converted into 2-digit codes.
- Shutdown[t]=1 if firm_size[t]>0 and firm_size[t+1]=0, also use payroll.
- The firm can have a positive firm size/payroll in the future.
- **Why not 'exits'?**
  - More difficult to identify.
  - Shutdowns are more relevant because the focus is on separations.
- Annual shutdown rates (SR) are from LEAP (based on all firms in the industry in a given year).

## Table 1: Firm Size Composition

| Firm Size | Age | Gender | Tenure | $w_t$ | SR | PL | Firms | Workers |
|---|---|---|---|---|---|---|---|---|
| XS | 41.8 | 0.47 | 4.83 | 25.7 | 0.130 | 0.050 | 110.5 | 126.1 |
| S | 40.5 | 0.43 | 5.18 | 32.1 | 0.128 | 0.054 | 83.9 | 136.3 |
| M | 40.1 | 0.39 | 5.34 | 38.0 | 0.125 | 0.049 | 47.8 | 177.0 |
| L | 40.8 | 0.41 | 7.22 | 48.9 | 0.121 | 0.025 | 9.3 | 450.0 |

Note: The firm size classes are: (XS) less than 5 employees; (S) 5-19 employees; (M) 20-99 employees; (L) 100+ employees. employees. Age and tenure is in years. Gender is the proportion of workers that are female. Earnings ($w_t$), firms and workers are in thousands. SR and PL are the shutdown rate and permanent layoff proportions.

# Estimation

**Selection Issue:** Nature of worker separation only observable for continuing firms. $\rightarrow$ Similar issue in Quintin and Stevens (2005).

**Two worker outcomes:**

1. Permanent Involuntary Worker Separation (Extensive margin) $\rightarrow$ Bivariate Probit.
   - Firm continue (1) or shutdown (0).
   - Worker experiences a permanent layoff (1) or not (0).
2. Worker annual earnings growth following an involuntary separation (Intensive margin) $\rightarrow$ selection model
   - Firm continue (1) or shutdown (0).
   - Worker earnings growth equation ($\Delta \log w_{ijt}$).

# Estimation: Identification

- **Functional forms:** Joint normality of the error terms.
- **Exclusion Restrictions:**
  1. Industry Real Exchange Rates: Campa and Goldberg (REStat, 2001)

$$RER_{jt} = P_{jt}^{US} / P_{jt}^{CDN} \times e_t$$

  2. Relative of the wage bill of the firm: Abowd, Kramarz, and Margolis (1999), Michelacci and Quadrini (2009) and Moscarini and Postel-Vinay (2012)

$$\log \overline{\text{wage bill}}_{ijkt} = \log \left( \frac{\text{wage bill}_{ijkt}}{\overline{\text{wage bill}}_{jkt}} \right). \tag{1}$$

**Note:** Real exchange not used in model which examines worker earnings.

# Results

1. Probability of a Permanent Layoff:
   - Males: Consistent results across firm size classes.
   - Females: Positive or neutral relationship.
2. Worker earnings growth following an involuntary permanent layoff:

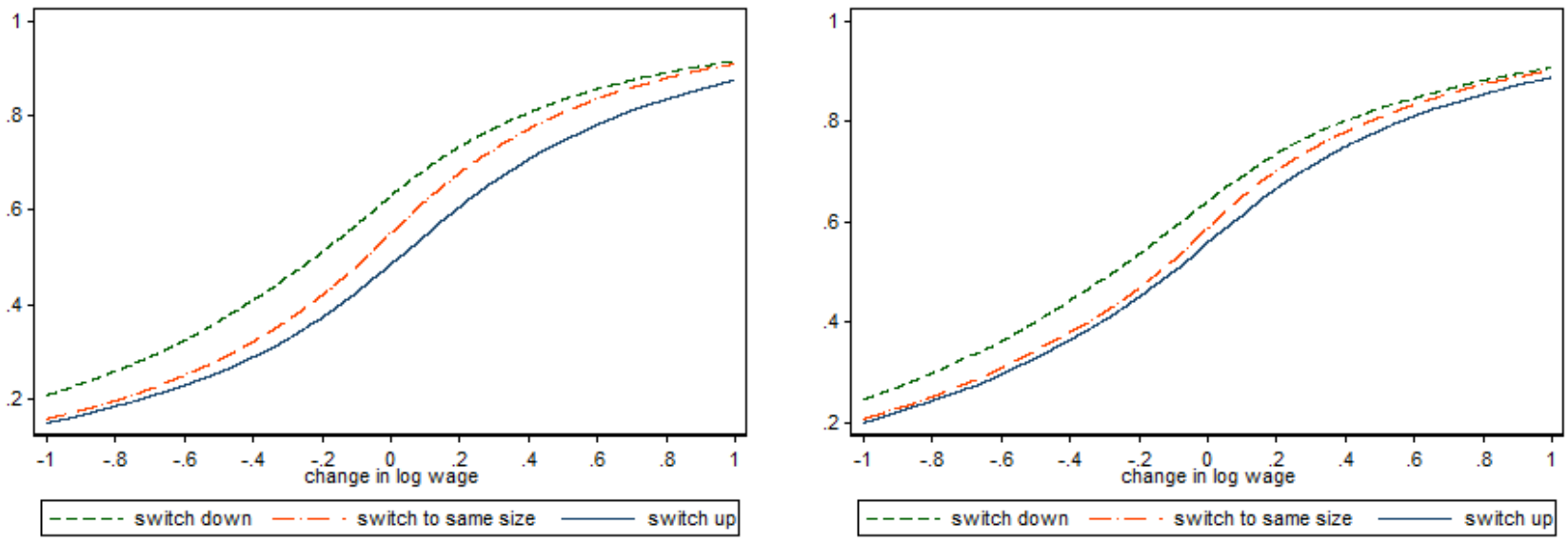
   - Selection less important.

Table 2: Industry SR ↑ 1%

| Probability(PL) | XS | S | M | L |
|---|---|---|---|---|
| Males | ↑ 0.14% | ↑ 0.14% | ↑ 0.13% | NC |
| Females | ↓ 0.01% | ↑ 0.11% | ↑ 0.03% | NC |
| **Earnings Growth** | **XS** | **S** | **M** | **L** |
| Males | ↓ 0.98% | ↓ 2.01% | ↑ 1.34% | ↓ 1.28% |
| Females | ↓ 3.40% | ↑ 0.16% | ↓ 1.86% | ↓ 1.32% |

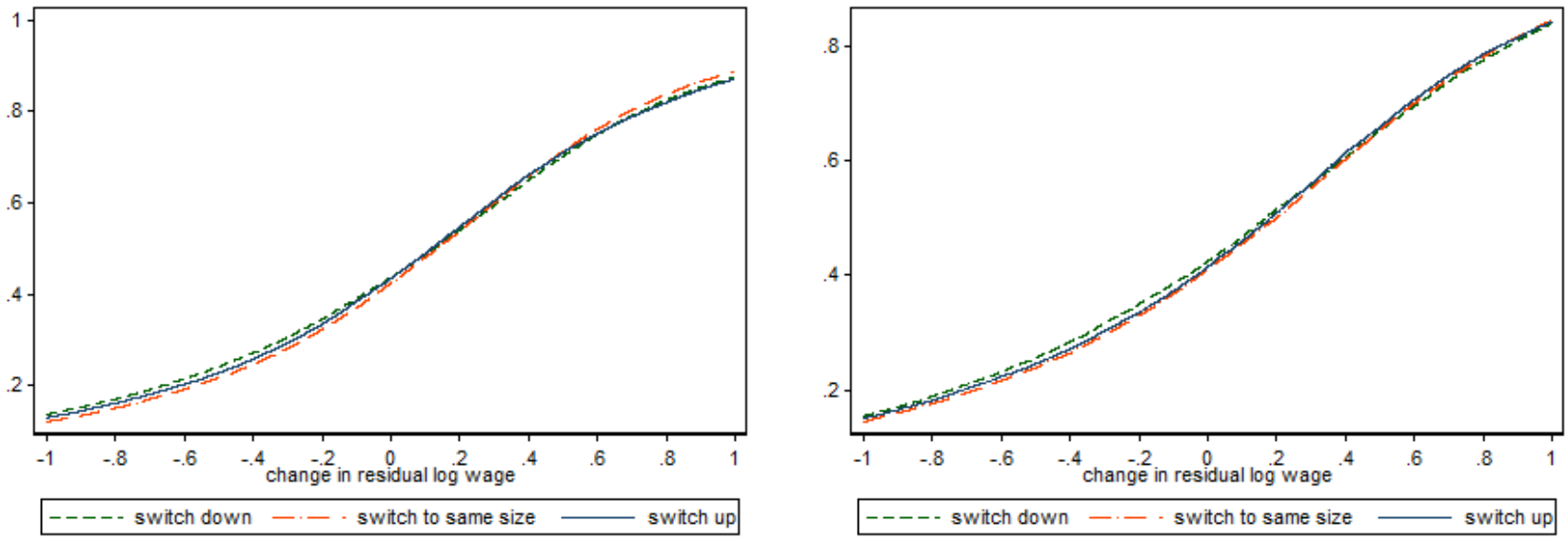
Note: NC indicates non-convergence when attempting to estimate the model. Firm size classes: (XS) less than 5 employees; (S) 5-19 employees; (M) 20-99 employees; (L) 100+ employees.

## Figure 1: Cumulative Distribution of $\Delta \log w_{ijt}$: Unconditional




Note: This graph illustrates the unconditional growth rate of wages ($\Delta \log w_{ijt}$) for male (first graph) and female (second graph) workers who experienced a permanent layoff and found a new job. The three lines are for groups of workers that: 1) transition to a smaller size firm (switch down), 2) transition to a larger size firm (switch up) and 3) transition to a same size firm.

## Figure 2: Cumulative Distribution of $\Delta \log w_{ijt}$: Conditional

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# Conclusion

- Industry shutdown rates generally have a positive and significant effect on the probability of a permanent worker layoff.
- For wage growth, shutdown rates have a negative effect but the effects are amplified for smaller firms.
- Accounting for firm selection effects does change our results.
- The results show that the processes of job turnover and wage outcomes have a rich set of dynamics related to firm characteristics and industry conditions.
- Points to the need to incorporate industry conditions along with firm and worker characteristics when investigating worker movement and reallocation.