The Long-Run Cost of Job Loss as Measured by Consumption Changes

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Introduction

- ## Motivation:
  - Permanent job loss may be a significant loss of lifetime wealth
  - Displaced workers bear a disproportionate cost of reallocation in a dynamic economy
  - The costs of job loss continue to be of considerable interest to economists and policy makers

Introduction

- **Keys problems:**
  - How can we measure a long-run outcome?
  - What is the appropriate counterfactual or benchmark?
  - What control sample might allow us to estimate outcomes under the counterfactual?

Introduction

- ## Our Solutions:
  - A theoretical framework (but without fully specifying the environment)
  - Use consumption changes to capture changes in the marginal utility of wealth
  - A full insurance (against job loss) benchmark – gives an upper bound on what policy might achieve
  - Use temporary layoffs with known recall date to estimate approximate the counterfactual

Introduction

- ## Related to several literatures:
    - Costs of job displacement (Ruhm, 1991; Jacobson et. al, 1993; Kletzer, 1998; Kuhn, 2002)
    - Test for full insurance and consumption smoothing (Cochrane, 1991; Dynarski and Gruber 1997; Stephens, 2001)
    - Short run effects of Unemployment on Consumption (Gruber, 1997;Browning and Crossley, 2001)

Outline

- Introduction

- Theoretical Framework

- Empirical Strategy

- Data:
  - The Canadian Out of Employment Panel
  - Sample and descriptive statistics
  - Expenditure questions and a first look at earnings and consumption changes

- Estimates

- Summary and Policy Implications

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Theoretical Framework

- **Euler Equation**

$$\lambda_{t+1} = \lambda_t + \varepsilon_{t+1}, \; E_t\left(\varepsilon_{t+1}\right) = 0$$

Retained:

d=1

- **Shocks**

$$\varepsilon_{t+1} = \left(1 - d\right)\Gamma_t^0 + d\Gamma_t^1 + \eta_{t+1}$$

Other
shocks

Displaced:
d=0

Γ^0

Displaced:
mue rises

0
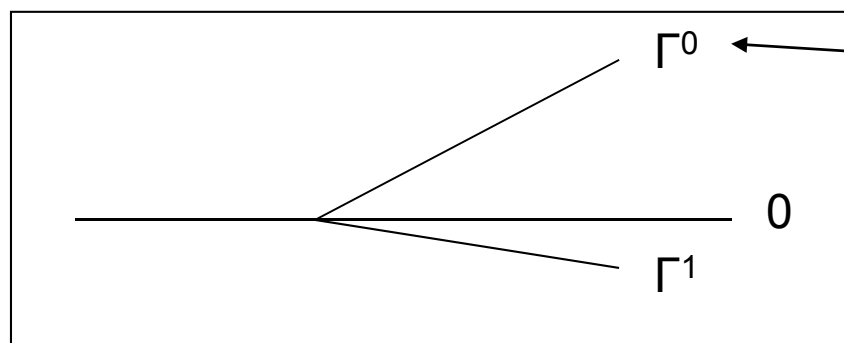
$$\Gamma_t^0 > 0 > \Gamma_t^1$$

Γ^1

Theoretical Framework

■ Full insurance against job loss: $\Gamma_t^0 = \Gamma_t^1 = 0$

Not displaced

$$E_t\left(\varepsilon_{t+1}\right) = \pi_t\left(\Gamma_t^1 + E_t\left(\eta_{t+1} \mid d = 1\right)\right) +$$

$$\left(1 - \pi_t\right)\left(\Gamma_t^0 + E_t\left(\eta_{t+1} \mid d = 0\right)\right)$$

Displaced

$$\pi_t\left(\Gamma_t^1 + E_t\left(\eta_{t+1} \mid d = 1\right)\right) = -\left(1 - \pi_t\right)\left(\Gamma_t^0 + E_t\left(\eta_{t+1} \mid d = 0\right)\right)$$

Theoretical Framework

- ## Observables:

  - ❑ consumption

$$\Delta \ln c_{t+1} = \Delta \phi_{t+1} - \Delta \lambda_{t+1}$$

$$E_t \left(\Delta \ln c_{t+1} \mid d = 0 \right) = \Delta \phi_{t+1} - \Gamma_t^0 - E_t \left(\eta_{t+1} \mid d = 0 \right)$$

$$= \Delta \phi_{t+1} - \Gamma_t^0 - \mu_t^0$$

Other shocks

Anticipated

Job loss

  - ❑ covariates $\quad \Gamma_t^0 = \gamma_t^0 + \gamma' z_t$

Theoretical Framework

- Object of interest: the average effect of displacement on the displaced (AETT)

$$E^H \left[E_t \left(\Delta \ln c_{t+1} \mid d = 0 \right) \mid d = 0 \right] \qquad (11)$$

$$= \quad E^H [\Delta \phi_{t+1,h} \mid d = 0] - E^H [\Gamma^0_{t,h}(z_{t,h}) \mid d = 0] - E^H [\mu^0_{t,h} \mid d = 0] \qquad (12)$$

$$= \quad E^H [\Delta \phi_{t+1,h} \mid d = 0] - E^H [\gamma^0_{t,h} \mid d = 0] - E^H [\gamma' z_{t,h} \mid d = 0] - E^H [\mu^0_{t,h} \mid d = 0] \qquad (13)$$

- Problem: how to estimate

$$E^H [\Delta \phi_{t+1,h} \mid d = 0] \text{ and } E^H [\mu^0_{t,h} \mid d = 0]$$

- Solution: matched controls

Empirical Strategy

- Problem: workers in continuing employment are not suitable controls because:

$$E_t \left(\Delta \ln c_{t+1} \mid d = 1 \right) = \Delta \phi_{t+1} + \Gamma_t^1 - E_t \left(\mu_{t,h}^1 \mid d = 1 \right)$$

- (and because they have very different observables)

- Solution: temporary lay offs with known recall date are insured by their firm:

$$\Gamma_t^0 \approx \Gamma_t^1 \approx 0$$

Empirical Strategy

1. Use consumption growth to measure innovations in the *mue*

2. Among the "treatment" group of job losers, consumption growth confounds the effects of job loss with the effects of other shocks and anticipated changes in the *mue*

3. Construct a matched control group drawn from workers experiencing temporary layoff

4. Use this group to estimate consumption growth under the counterfactual of full insurance (common support, conditional independence of $\mu_{t,h}^0$ and $\Delta\phi_{t+1,h}$)

5. The difference in consumption growth between the treatments and matched controls is an estimate of the cost of job loss among the job losers

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Data

- ## Canadian Out of Employment Panel

  - Workers separating from jobs for any reason in 1993 and 1995

  - Multiple interviews; Final interview 5th quarter after separation

  - Wide variety of questions, including household consumption

  - We study the change in monthly household consumption from just prior to separation to the final interview

Data

- ## Sample
  - Aged 20-60
  - Self-reported lay offs and quit to take another job
  - Exclude:
    - living with parents or unrelated adults
    - Multiple jobs, at least one continuing
    - Reference job tenure < 6 months
  - Divide layoffs on the basis of ex *ante* expectation of recall

TABLE A2: Descriptive Statistics: Pre - Reference Separation Information

	Layoffs			Quits
	No Expectation of Recall	Some Expectation of Recall	Strong Expectation of Recall	
1st Interview Obs.	3023	1417	1094	402
COEP 1995 (%)	845 (28%)	1122 (79%)	794 (73%)	344 (86%)
Last Interview Obs. (%)	2199 (73%)	1127 (80%)	890 (81%)	315 (78%)
Demographics				
highschool	0.37	0.42	0.44	0.42
college	0.33	0.21	0.27	0.43
age	38.0	37.8	39.0	32.7
ln (household size)	0.94	0.95	1.03	0.89
male	0.53	0.61	0.48	0.60

TABLE A2: Descriptive Statistics: Pre - Reference Separation Information (Cont´d)				
		Layoffs		Quits
	No Expectation of Recall	Some Expectation of Recall	Strong Expectation of Recall	
Reference Separation Job				
manager	0.28	0.18	0.28	0.30
blue collar	0.33	0.61	0.46	0.29
union	0.27	0.42	0.47	0.15
seasonal	0.10	0.28	0.33	0*
expected loss	0.45	0.71	0.81	1*
Job Tenure (Months)	65.2	80.4	89.7	44.5
Monthly Earnings	1.89	1.76	1.65	1.76
Program Use				
UI in at least 1 of past 2 years	0.55	0.80	0.74	0.40

Data

- Expenditure Questions:

  About how much did you and your household spend on everything in the past month? Please think about all bills such as rent, mortgage loan payments, utility and other bills, as well as all expenses such as food, clothing, transportation, entertainment and any other expenses you and your household may have.

  Has the amount you spend on everything decreased since <ROE>?
  By what amount monthly?

  Has the amount you spend on everything increased since <ROE>?
  By what amount monthly?

- Lots of evidence that these collect valid and useful information

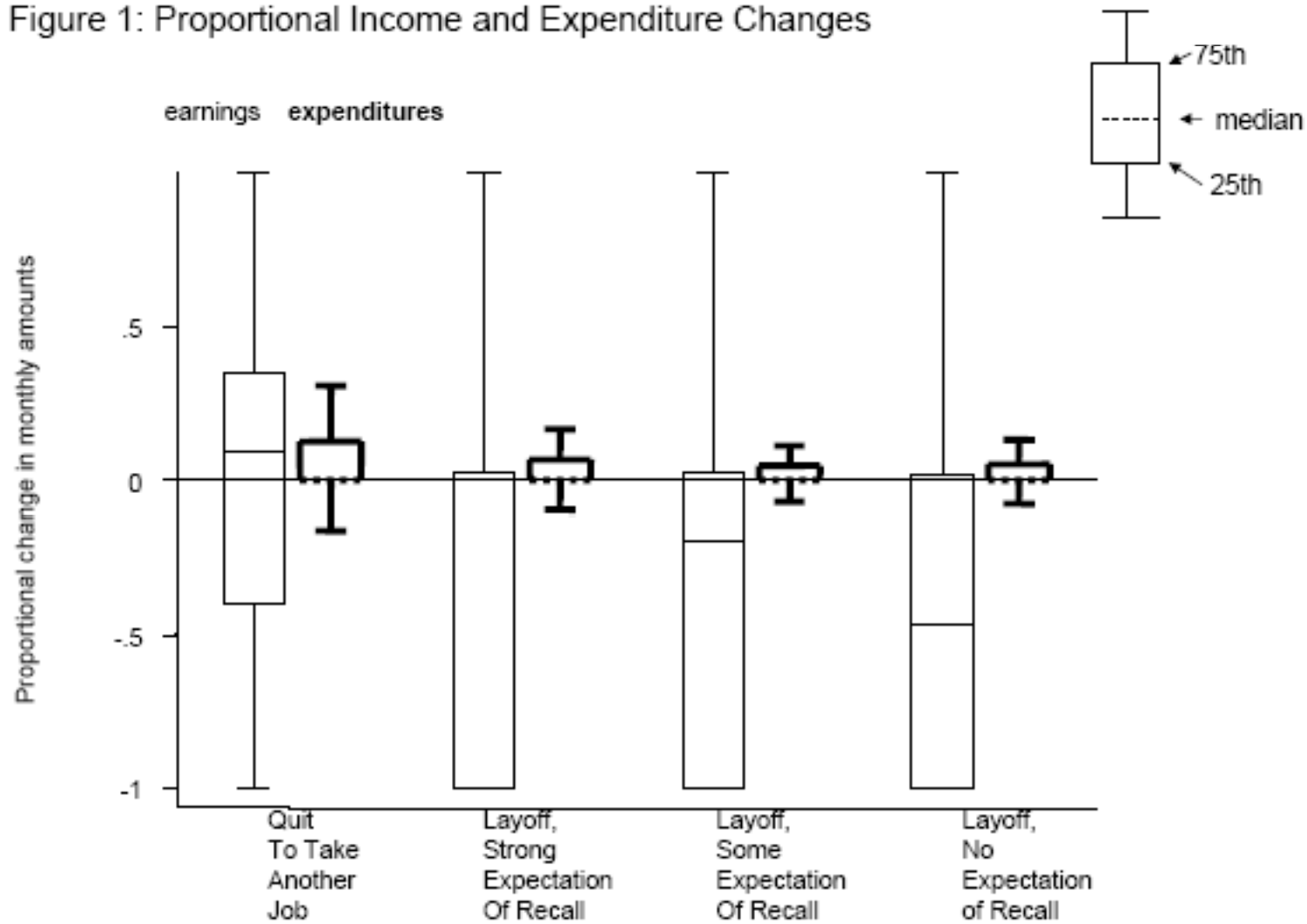Figure 1: Proportional Income and Expenditure Changes

TABLE 1a: Descriptive Statistics: Earnings and Expenditure Changes
Pre- reference separation to last interview
Proportional Changes in nominal monthly Amounts
All Final Interview Respondents

		Layoffs			Quit
		No Expectation of Recall	Some Expectation of Recall	Strong Expectation of Recall	
Earnings	q1	−1	−1	−1	−0.40
	q2	−0.47	−0.19	0	0.09
	q3	0.016	0.025	0.025	0.04
	mean	−0.44	−0.39	−0.31	−0.013
Difference of mean from no expectation group, [t-stat]			0.044 [1.9]	0.13 [5.1]	0.42 [11.1]
Kruskal–Wallis rank test of common distribution with no expectation group: $\chi^2_{(1)}$ (p-value)			8.6 (0.003)	36.5 (<0.001)	109.2 (<0.001)
Total Expenditure	q1	0	0	0	0
	q2	0	0	0	0
	q3	0.051	0.044	0.063	0.11
	mean	−0.033	0.005	0.023	0.067
Difference of mean from no expectation group, [t-stat]			0.038 [4.2]	0.056 [5.7]	0.099 [6.7]
Kruskal–Wallis rank test of common distribution with no expectation group: $\chi^2_{(1)}$ (p-value)			11.6 (<0.001)	30.0 (<0.001)	39.0 (<0.001)

Estimates

- Propensity Scores estimated with a Probit (Table 2)

- Conditioning on:

  - a quadratic in age, gender, education dummies and the logarithm of household size

  - dummies for marital status and spousal employment status

  - dummies indicating capital income and home ownership

  - occupation dummies, a union dummy and job tenure dummies;

  - a dummy for unemployment insurance use in the previous two years

  - a polynomial in earnings in the reference job

  - the local unemployment rate
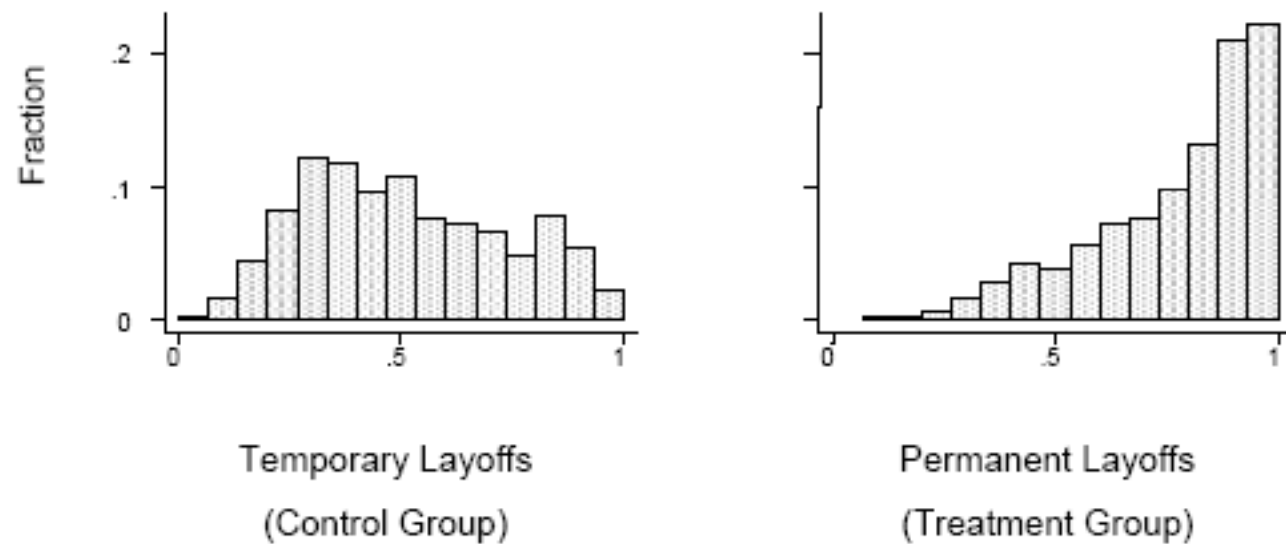
  - region and time dummies.

Figure 3: Distributions of Propensity Scores for Permanent Layoff

Estimates

- **Propensity Score Matching**
  - Common support imposed
  - Balancing tests
  - Locally Linear Regression, matching on propensity score
  - Results robust to: more trimming, bandwidth, matching on index, nearest neighbor matching
- **Inference**
  - 999 bootstrap replications

TABLE 3a:	The Effect of Permanent Job Loss on Consumption Growth - Baseline Estimates			
	Sample Sizes	Mean Consumption Growth (%)		
		Permanent Layoffs	Temporary Layoffs	Difference
	Treated		With Recall Date	[95% C.I.]
	Controls	(Treated)	(Controls)	
Unmatched Comparison	1461	-3.1	2.5	-5.6
	657			[-7.73, -3.55]
Matched Controls, Common Support	1449	-3.0	3.4	-6.4
	657			[-9.6, -3.8]

TABLE 3b: The Effect of Permanent Job Loss on Consumption Growth - Subsamples
(Matched Controls, Common Support)

| | Sample Size Treated Controls | Mean Consumption Growth (%) | | Difference [95% C.I.] |
		Permanent Layoffs (Treated)	Temporary Layoffs With Recall Date (Controls)	
Unionized	386	-2.6	2.1	-4.7
	305			[-8.4, -0.8]
Age > 40 years	579	-6.4	2.9	-9.3
	264			[-14.3, -4.5]
Job Tenure > 10 years	218	-7.4	3.0	-10.4
	172			[-17.6, -3.8]
Women	701	-2.6	4.4	-6.9
	347			[-12.0, -2.0]

TABLE 3c: The Effect of Permanent Job Loss on Consumption Growth – Subsamples II
(Matched Controls, Common Support)

| | Sample Size | Mean Consumption Growth (%) | | Difference [95% C.I.] |
	Treated Controls	Permanent Layoffs (Treated)	Temporary Layoffs With Recall Date (Controls)	
Advanced Notice	503	-1.6	5.0	-6.6
< 6 weeks (incl. 0)	392			[-13.3, -0.9]
Expected Job Loss	599	-2.4	8.0	-10.4
< 6 weeks (incl. 0)	293			[-14.7, -2.9]
Employed at Last	780	-0.5	5.1	-4.6
Interview	399			[-7.5, -1.8]

TABLE A5: The Effect of Permanent Job Loss on Consumption Growth – Robustness Checks

	Sample Size	Mean Consumption Growth (%)		Difference
	Treated Controls	Permanent Layoffs (Treated)	Temporary Layoffs With Recall Date (Controls)	
Halved the bandwidth in local linear regression used in matching	1449 657	–3.0	3.7	–6.6
Doubled the bandwidth	1449 657	–3.0	3.1	–6.1
Deleted the 5% of treatments whose propensity scores corresponded to the lowest estimated densities among controls	1388 657	–2.9	2.8	–5.7
Matched in the index rather than the predicted probability	1449 657	–3.0	3.3	–6.3
Used a single nearest neighbour match rather than locally linear regression	1449 657	–3.0	2.5	–5.5
More parsimonious specification of the propensity score model	1688 723	–3.5	2.4	–5.9

Summary and Policy Implications

- Displaced Workers bear a disproportionate share of the costs of economic adjustment; it is important to measure their losses

- Consumption data and a theoretical framework allow us to measure a long-run outcome from a short panel

- It is important to define the counterfactual and tailor the estimation strategy to that counterfactual

Summary and Policy Implications

- Permanently displaced workers experience a consumption loss of 4-10% relative to a full insurance benchmark (point estimate: 6.4%)

- The losses of older and high tenure workers may be larger (point estimates around 10%)

Summary and Policy Implications

- ## The approach in this paper

  - Delivers an upper bound on the benefit of *any* new cost mitigating policy in the current economic environment.

  - Without fully specifying the environment

- ## However…

  - Not informative about the consequences of removing current provisions

  - Need a full structural model to evaluate particular policy proposals