The Long-Term Externalities of Short-Term Disability Insurance

Michael Stepner

NBER Summer Institute

Economics of Social Security

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Public and Private Insurance Spillovers

Public insurance programs interact with private insurance

- **Theory:** spillovers occur when multiple insurance programs insure the same risk (Pauly 1974, Golosov and Tsyvinski 2007, Chetty and Saez 2010)
- Ex: Public and private health insurance (Cabral and Mahoney 2017)
- Ex: Public and private long-term care insurance (Brown and Finkelstein 2008)
- Ex: Worker's compensation and disability insurance (Campolieti and Krashinsky 2003)

Spillovers may be substantial between short-term and long-term disability insurance (DI)

- More than 1/3rd of U.S. and Canadian workers have private short-term DI
- U.S. spent $158 billion on SSDI and $65 billion on SSI in 2025

What does employer-provided STDI do?

1. Provides increased insurance
    - Benefits while unable to work but not yet eligible for long-term DI
    - Private short-term DI is more generous than EI Sickness
        - Makes being out of work due to illness less costly

2. Gives employers a financial stake in employee disabilities
    - Employers bear cost of private disability benefits
    - Financial incentive to provide workplace accommodations
        - Most private short-term DI comes with back-to-work supports

What does employer-provided STDI do?

1. Provides increased insurance
    - Should **increase** long-term DI take-up rates

2. Gives employers a financial stake in employee disabilities
    - Should **decrease** long-term DI take-up rates

⇒ **Net effect is an empirical question.**

Industry speculation: STDI lowers LTDI takeup

> Products like […] Short Term Disability allow us to intervene early, help support shorter claim durations and prevent long-term disability claims.
>
> — Great-West Life (2018)

Academic speculation: STDI lowers LTDI takeup

In *Supporting Work: A Proposal for Modernizing the U.S. Disability Insurance System*, David Autor and Mark Duggan propose universal private STDI, with partial income replacement and workplace supports.

> The [private STDI] policy proposal should ultimately reduce total employee and employer disability insurance costs by assisting some workers with work-limiting disabilities to remain in the labor force rather than becoming long-term beneficiaries of the SSDI system.
>
> — Autor and Duggan (2010)

Identification: using unique Canadian data and institutions

- Best evidence using US survey data is inconclusive (Autor et al. 2013)

- Two key ingredients, which exist in Canada:

  1. Linked data on private STDI coverage and public LTDI take-up

     - Payroll tax rebate for private STDI through the EI Premium Reduction Program (PRP), which is unique within OECD (ESDC 2009)

     - EI PRP coverage, CPP-D and QPP-D benefits observed in administrative tax records

  2. Plausibly random variation in private STDI coverage

     - Use the timing of firms ending their private STDI plans

Research Questions

Does private STDI increase or decrease take-up of public LTDI?

- How large is the effect on the total stock of LTDI recipients?
- How large is the fiscal externality on the government LTDI budget?
- What size Pigouvian tax on private STDI would internalize that externality?

Preview of Results

Among 25-59 year old Canadian workers at firms ending private STDI:

- Private STDI **increases** 2-year take-up of public LTDI by 0.07 pp (33%)

Extrapolating to all 25-59 year old Canadian workers with private STDI:

- In 2015, public LTDI program was **5% larger** because of private STDI
  - Generated additional 18,300 public LTDI recipients (95% CI: 3,000 to 34,000)
  - Increased public LTDI spending by $230 million (95% CI: 40 to 410 million $)
- The cost of a private STDI plan in terms of future public LTDI spending is approx. $35 per insured worker per year (95% CI: $5 to $65)

Institutions and Data

Employment Insurance Sickness Benefits

- Federal government provides short-term DI to all workers:
  - If worked 600 hours in previous 52 weeks
  - “Unable to work because of sickness, injury or quarantine”
  - Obtain a medical certificate signed by doctor
  - 2 week waiting period (during my sample)
  - 55% replacement rate, up to $2370 per month, up to 15 weeks

Employment Insurance Sickness Premiums

- All employers and employees pay EI premiums as a payroll tax
- No experience rating or risk adjustment
  - All employers and employees pay same rate
- Premium rate adjusted each year in order to break even

Private Short-Term Disability Insurance

- Employers can opt to provide private STDI to some or all employees
  - >36% of workers have private STDI, most common in larger firms
  - Participation in private STDI plans is mandatory when offered

- Private STDI plans are the first payer of benefits
  - EI Sickness Benefits are reduced dollar-for-dollar
  - Private STDI benefits replace public EI Sickness benefits

Premium Reduction Program

- Employers/employees with private STDI can pay reduced EI premiums
  - $1.3 billion in premium reductions in 2023 for 7 million workers
- The private STDI plan must meet adequacy criteria (4 categories)
- Premium Reduction = expected savings to public STDI
  - No experience rating or risk adjustment

Private STDI Has More Generous Benefits

- 2008 survey of 400 firms (ESDC, PRP Summative Evaluation 2009)
  - Average replacement rate is 70% (instead of 55%)
  - Average benefit duration is 20 weeks (instead of 9)
  - Typical waiting period of 0 days or 7 days (instead of 14)
- Most private plans have ancillary services to help return to work
- Typically no gap in benefits between private STDI and LTDI
  - Workers who exhaust EI Sickness benefits often face a gap before LTDI benefits begin

Summary of Institutional Details

- Employers can provide private STDI and get EI Premium Reduction

- Employer-provided STDI is more generous than EI Sickness

What are the effects of employer-provided private STDI on public LTDI take-up and spending?

Linked Administrative Data

Universe of Canadian workers and firms from 2000 to 2015

- Link workers to employers and observe earnings [T4 slips]
  - Identify which workers receive private STDI using premium reductions
- Observe CPP-D and QPP-D benefit receipt [T4A(P) slips]
  - Private LTDI providers require all beneficiaries to apply for public LTDI
- Observe age, sex [T1 filings]
- Observe EI Sickness benefit receipt [EI Status Vector records]
- Observe inpatient stays at acute care hospitals [Discharge Abstract Database]
  - Database excludes QC and MB. I exclude admissions for childbirth.

Methods

Cross-Sectional Variation in Private STDI

- Regression of interest:

$$1(\text{LTDI Receipt})_{i,t+1} = \beta \cdot 1(\text{Employer STDI Coverage})_{i,t} + \theta \mathbf{X}_i + \varepsilon_i$$

- **Challenge:** Employer STDI coverage is not randomly assigned
  - Workers with private STDI are different from those without
  - Controlling for observables unlikely to identify causal parameter

Imbalance on Observables

	Workers in 2010	
	Private STDI	Public STDI
Earnings Quintile		
1 – Poorest	7%	32%
2	14%	25%
3	22%	18%
4	27%	13%
5 – Richest	30%	11%
Age 25-29	11%	16%
Age 30-39	27%	27%
Age 40-49	32%	30%
Age 50-59	30%	27%
Female	50%	46%
N	5,266,000	5,752,864

Quasi-Experimental Variation in Private STDI

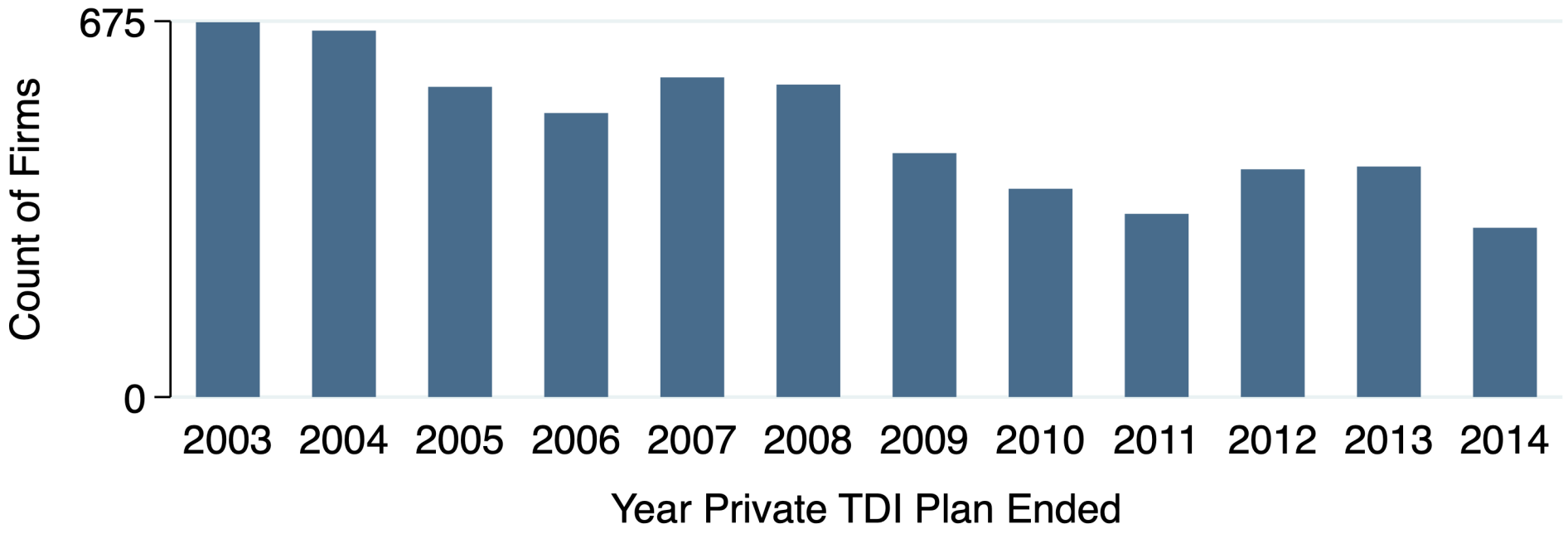
- Isolate variation in private STDI due to timing of firms ending STDI
  - Compare employees of firms that end their private STDI…
  - …to employees of firms that end their private STDI two years later
- **Hypothesis:** these employees are similar to each other
  - Employed by a firm that chose to offer private STDI, then to stop
  - Differ only in *when* their employer decided to stop
- **Identifying assumption:** timing uncorrelated with employees' risk of long-term disability
  - Ex: violated if firms end private STDI because employees' health is deteriorating

Balance on Observables

	All Workers in 2010		Quasi-Experiment Sample	
	Private STDI	Public STDI	Treated	Comparison
Earnings Quintile				
1 – Poorest	7%	32%	5%	4%
2	14%	25%	23%	21%
3	22%	18%	29%	29%
4	27%	13%	24%	25%
5 – Richest	30%	11%	19%	20%
Age 25-29	11%	16%	14%	14%
Age 30-39	27%	27%	28%	27%
Age 40-49	32%	30%	33%	33%
Age 50-59	30%	27%	25%	26%
Female	50%	46%	41%	39%
N	5,266,000	5,752,864	176,653	187,227

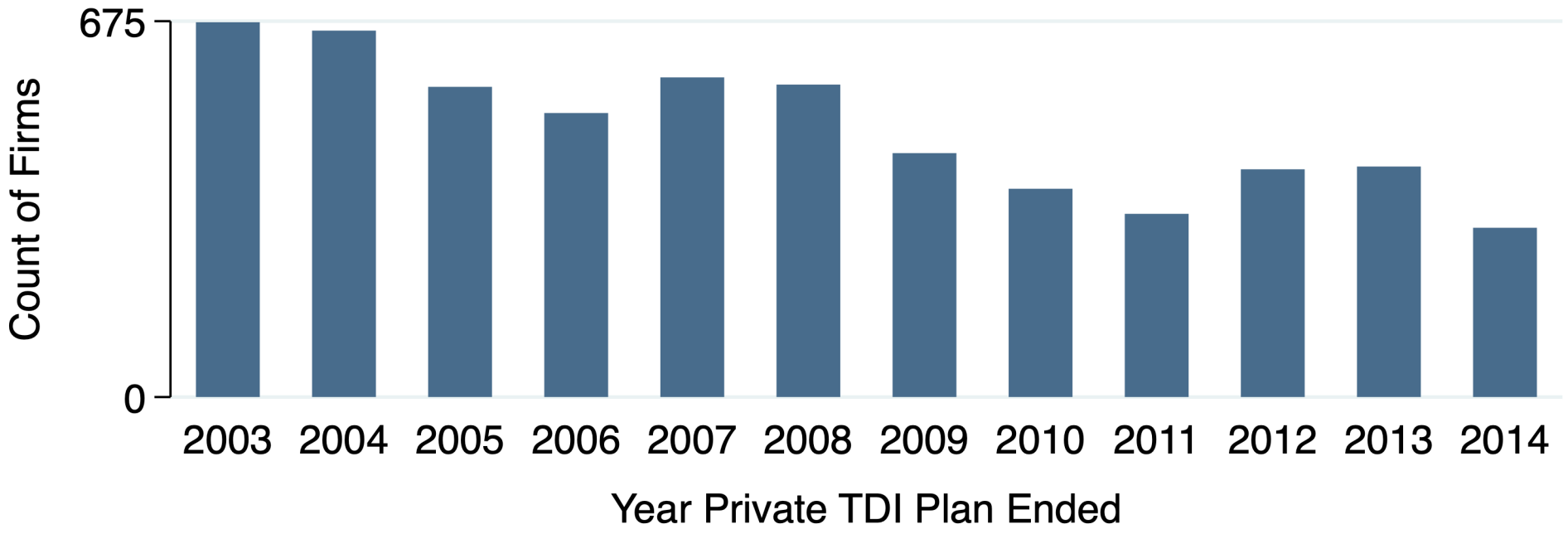
Sample Selection

- Identify firms that end their private STDI plan
  - Participated in EI PRP for 3 straight years for **some or all** workers
  - Continued to operate but did not participate in EI PRP for **any** workers in the next 3 years
- 5,801 firms end their private STDI between 2003 and 2014



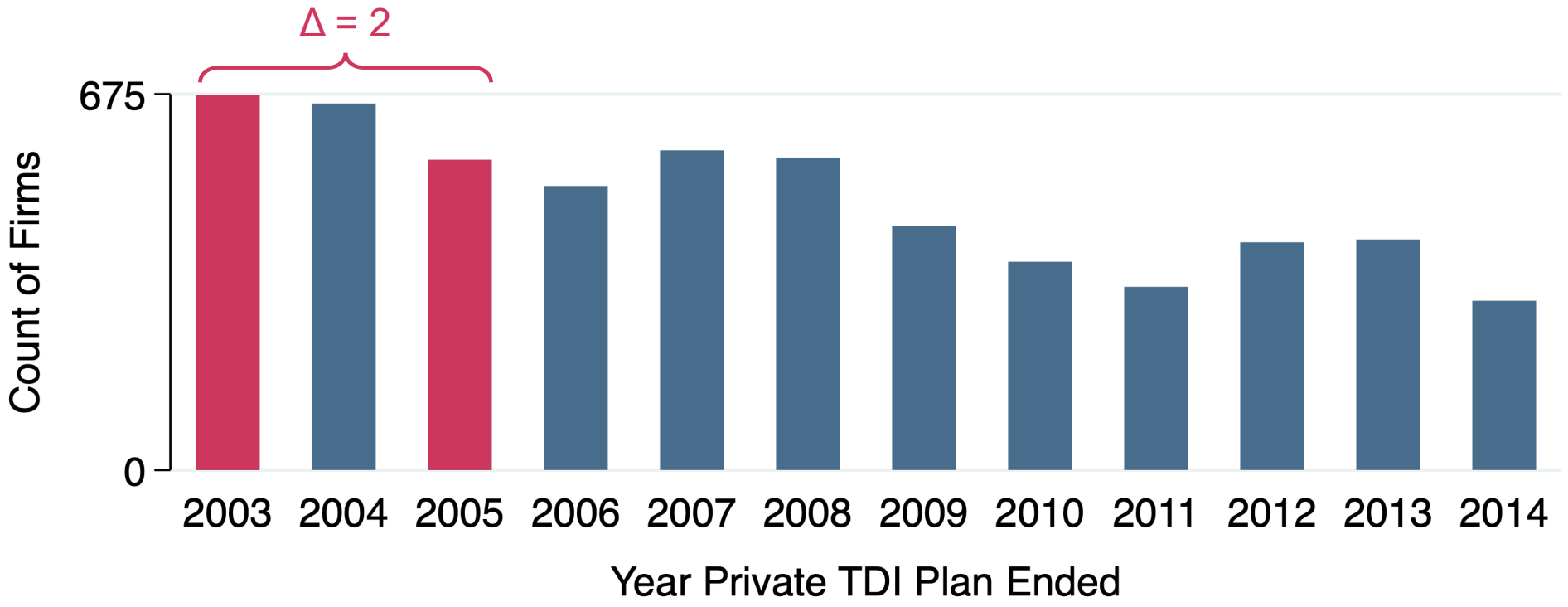
Research Design

- Compare employees of firms that end their private STDI two years apart



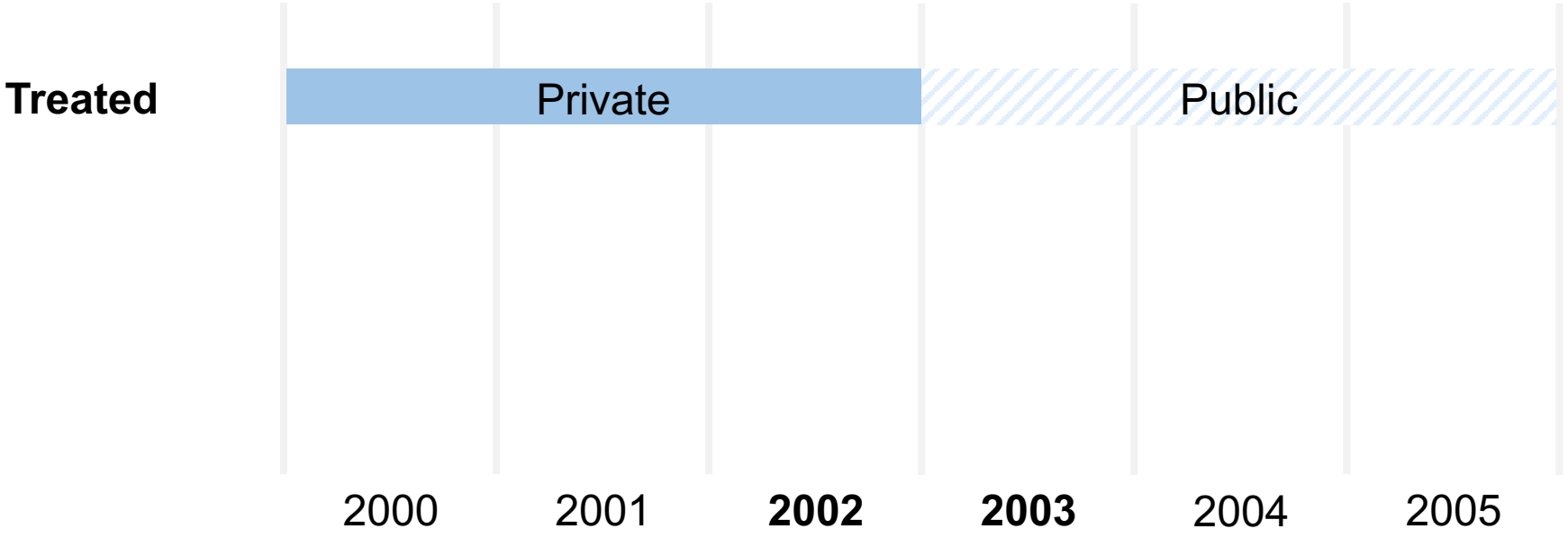
Research Design

- Compare employees of firms that end their private STDI two years apart
  - Ex: Firms ending STDI in 2003 compared to firms ending in 2005



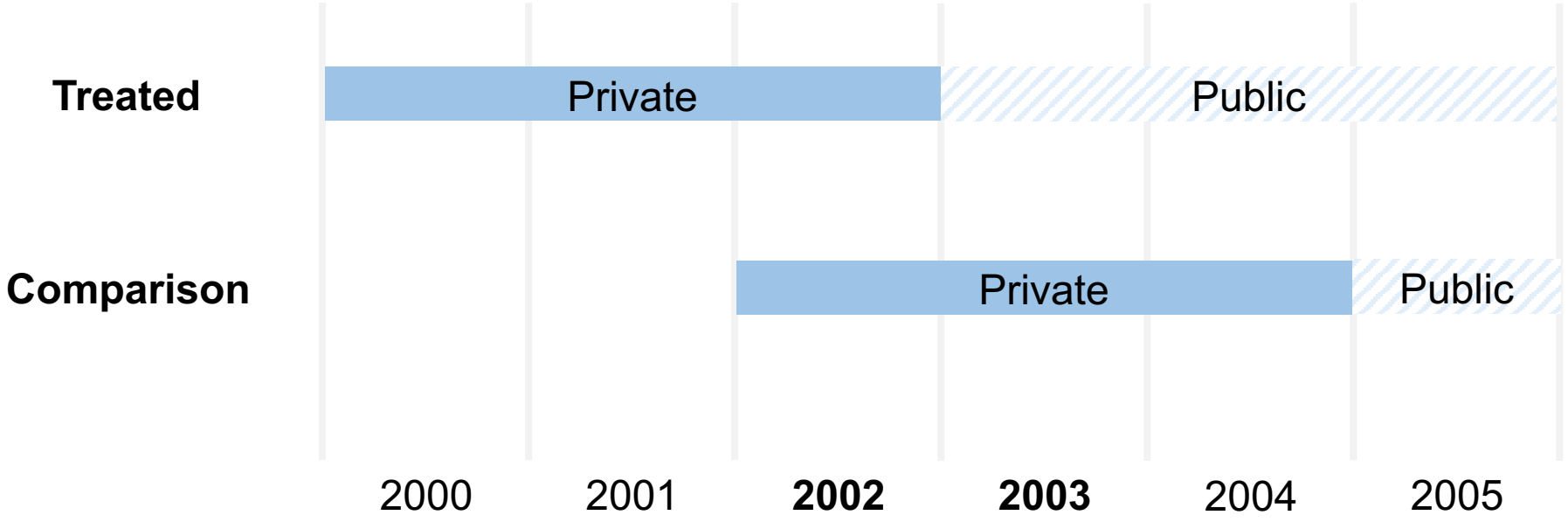
Research Design: 2003 Cohort

- **Treated employees:**
  - Employed in 2002 and 2003 by a firm ending private STDI in 2003



Research Design: 2003 Cohort

- **Treated employees:**
  - Employed in 2002 and 2003 by a firm ending private STDI in 2003
- **Comparison employees:**
  - Employed in 2002 and 2003 by a firm ending private STDI in 2005



Combine Ten Cohorts in Pooled Event Study

Cohort Year	Calendar Year														
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
2003	-2	-1	0	1	2	3									
2004		-2	-1	0	1	2	3								
2005			-2	-1	0	1	2	3							
2006				-2	-1	0	1	2	3						
2007					-2	-1	0	1	2	3					
2008						-2	-1	0	1	2	3				
2009							-2	-1	0	1	2	3			
2010								-2	-1	0	1	2	3		
2011									-2	-1	0	1	2	3	
2012										-2	-1	0	1	2	3

Combine Ten Cohorts in Pooled Event Study

Cohort Year	Relative Year					
	-2	-1	0	1	2	3
2003	2000	2001	2002	2003	2004	2005
2004	2001	2002	2003	2004	2005	2006
2005	2002	2003	2004	2005	2006	2007
2006	2003	2004	2005	2006	2007	2008
2007	2004	2005	2006	2007	2008	2009
2008	2005	2006	2007	2008	2009	2010
2009	2006	2007	2008	2009	2010	2011
2010	2007	2008	2009	2010	2011	2012
2011	2008	2009	2010	2011	2012	2013
2012	2009	2010	2011	2012	2013	2014

Sample Restrictions

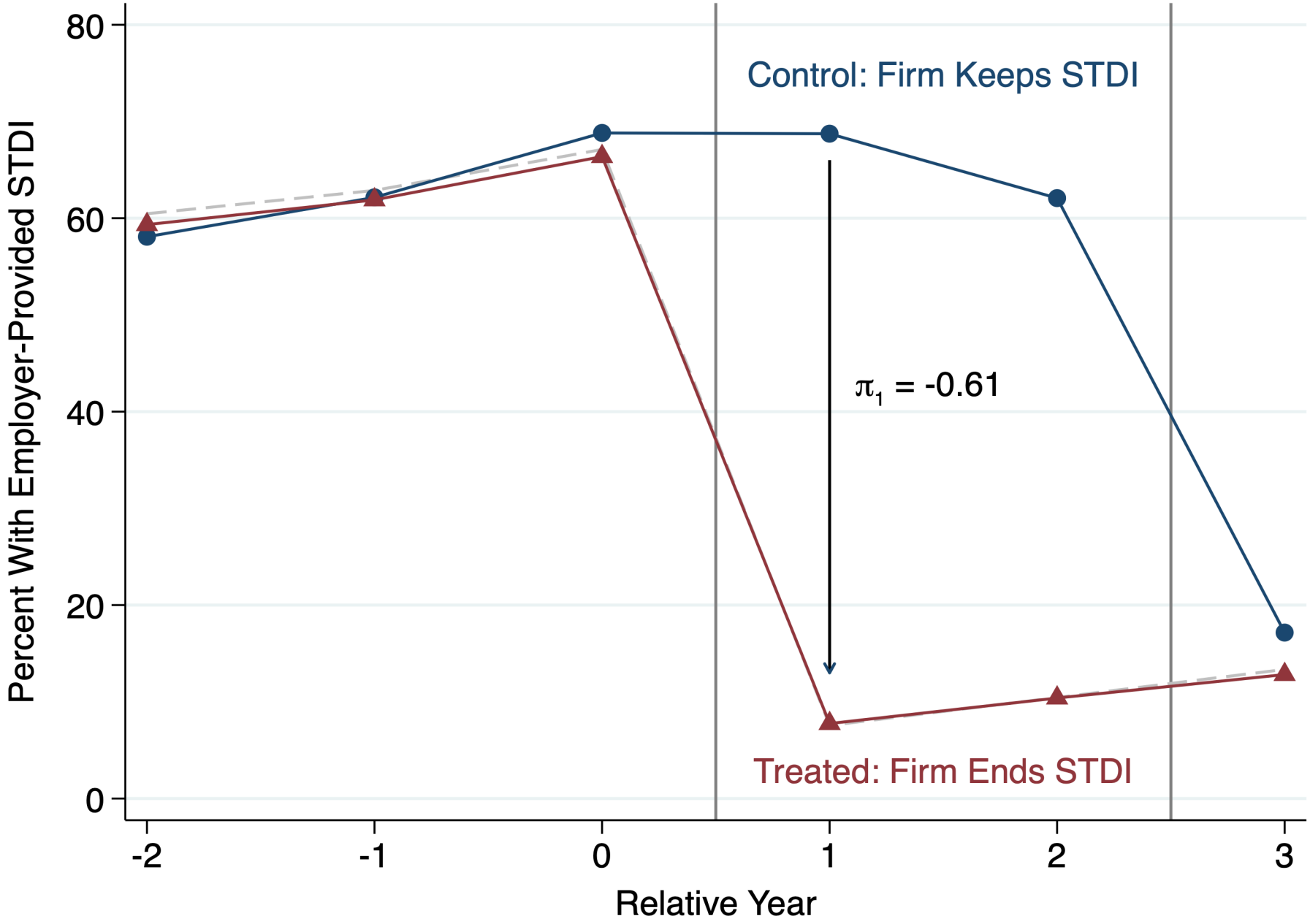
- Canadians 25-59 years old
- Earnings eligible for CPP-D
  - Earnings > threshold in 4 of the previous 6 years
- Have not received CPP-D during previous 3 years

Pooled Analysis Sample

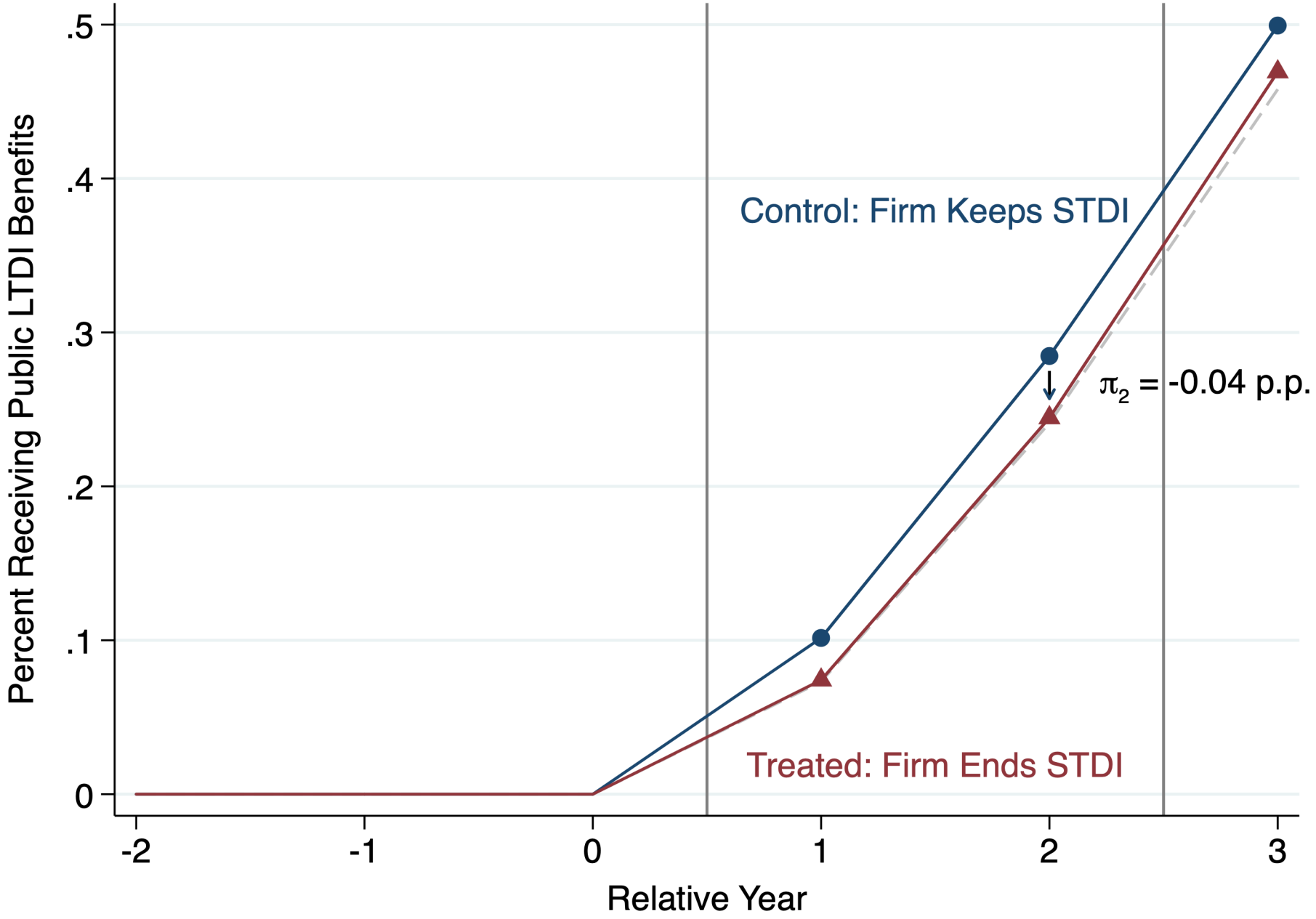
- 176,653 treated workers
- 187,227 comparison workers

Results

First Stage: Firms Ending Private STDI Lower Private STDI Coverage



Reduced Form: Firms Ending Private STDI Lower Public LTDI Receipt



Instrumental Variable Regression

Regression of interest:

$$1(\text{LTDI Receipt})_{i,t+1} = \beta \cdot 1(\text{Employer STDI Coverage})_{i,t} + \theta \mathbf{X}_i + \varepsilon_i$$

First stage:

$$1(\text{Employer STDI Coverage})_{i,t=1} = \pi_1 \cdot 1(\text{Treated})_i + \theta_1 \mathbf{X}_i + \varepsilon_i$$

Reduced form:

$$1(\text{LTDI Receipt})_{i,t=2} = \pi_2 \cdot 1(\text{Treated})_i + \theta_2 \mathbf{X}_i + \varepsilon_i$$

IV estimate:

$$\beta = \frac{\pi_2}{\pi_1}$$

IV Regression Results

	% Receiving Public LTDI Benefits in Year 2			
Private STDI Coverage in Year 1	0.066 (0.032)	0.071 (0.035)	0.072 (0.030)	0.071 (0.031)
Fixed Effects:				
Employer Switch Cohort		X	X	X
Interacted 5-Year Age and Sex			X	X
Earnings Decile in Prev. 3 years			X	X
Industry (2-digit NAICS)				X
Percent Effect	30%	31%	33%	33%
First Stage Coefficient	-0.61	-0.61	-0.61	-0.61
First Stage *F* stat	232648	233729	239817	244701
Sample Size	363,880	363,880	363,880	363,880

What does employer-provided STDI do?

1. Provides increased insurance
   - Should **increase** long-term DI take-up rates
     - Being out of work due to illness is less costly

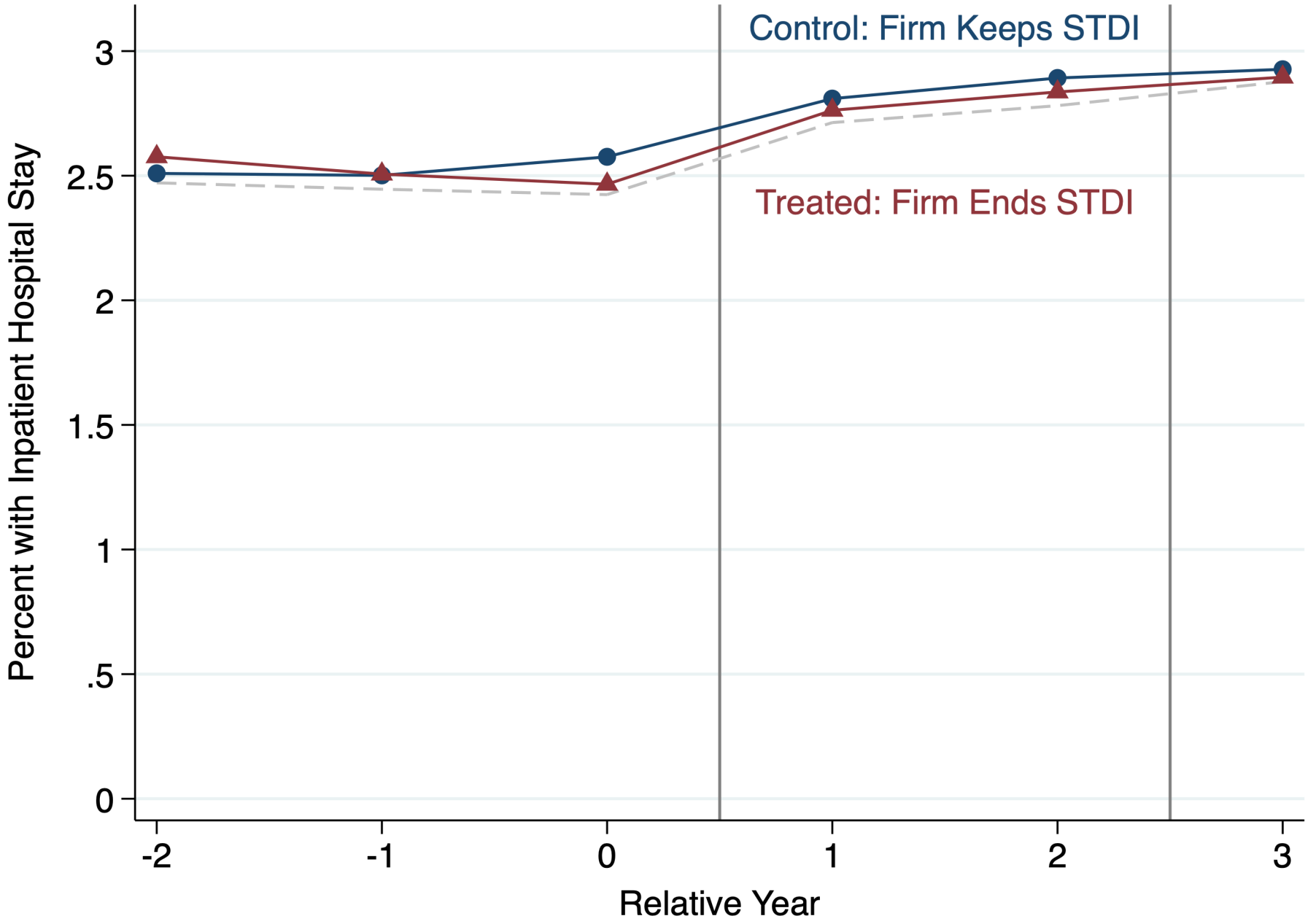
2. Gives employers a financial stake in employee disabilities
   - Should **decrease** long-term DI take-up rates
     - Increased accommodations to help return to work

⇒ The **increase** in LTDI take-up caused by more generous benefits **outweighs** any decrease caused by greater accommodation.

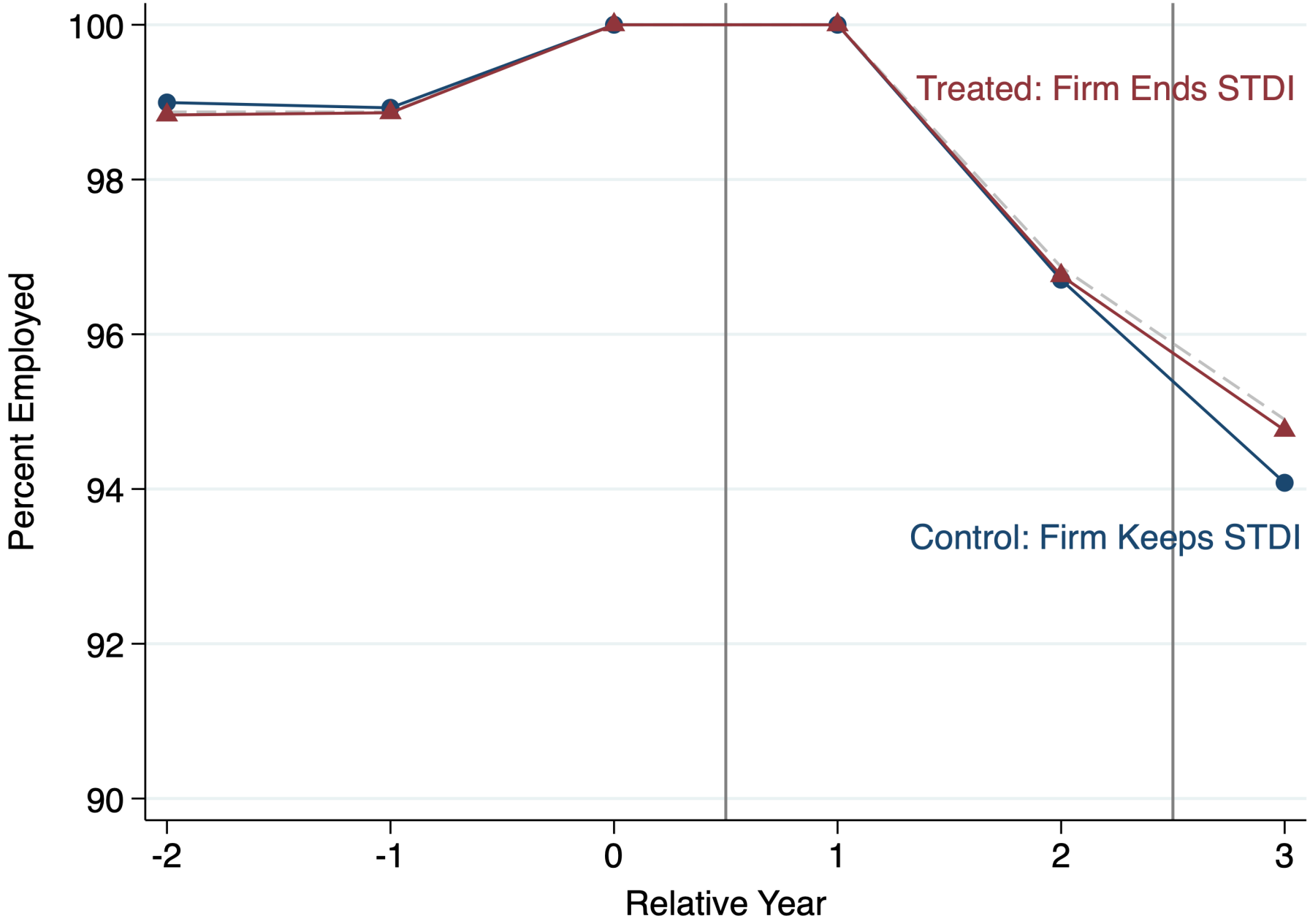
Threats to Identification

- Why are employer choosing to end their private STDI plans?
  - Employees becoming sicker, too expensive to insure?
  - Hard times for the company, less need to attract and retain workers?
    (Black, Daniel and Sanders 2002; Charles, Li and Stephens 2017)
- If timing of firms ending their private STDI is correlated with changes in employees' risk of LTDI, the quasi-experiment isn't valid.
  - Results would be biased

Hospitalization Rates are Similar



Employment Rates are Similar



Why not study firms *starting* private STDI?

- Employer awareness of the EI Premium Reduction Program is low
  - 72% of firms offering private STDI plans were unaware of the PRP according to a 2007 survey of 607 employers (ESDC 2009)
- I observe EI PRP participation, not existence of private STDI
  - Timing of firms exiting EI PRP reveals timing of them ending STDI
  - Timing of firms joining EI PRP **does not** reveal timing of them starting STDI
    - Many employers start offering private STDI, join PRP later
    - Can detect this in the data
- Results for firms *starting* private STDI are highly attenuated, but consistent with results shown

Discussion

How large is the effect of private STDI on LTDI?

Quasi-Experimental Result:

- Among 25-59 year old workers at firms ending private STDI, private STDI increases the *flow* onto public LTDI by 0.07 percentage points (33%).

Aggregate questions:

- What is the effect of private STDI on the *stock* of public LTDI recipients?
- What is the effect of private STDI on the *budget* for public LTDI benefits?

The aggregate results will be necessarily speculative.

- They provide an illustrative approximation, not a precise value.

Extrapolating from flows to stocks

Counterfactual: If Canadian employers had not provided private STDI during the 15 years from 2000-2014, how would the quantity of LTDI recipients and expenditures differ in 2015?

Four assumptions required for approximation:

1. The effect of private STDI on annual flows onto LTDI is 0.071 / 2 = 0.036 percentage points, half the two-year quasi-experimental estimate.

2. The effect of private STDI on LTDI take up is constant for all workers with private STDI.

3. Marginal LTDI recipients, who only take up when they have private STDI, have the same LTDI exit rates and mean benefit amounts as the average LTDI recipient who had private STDI prior to take-up.

4. People who don't take up LTDI remain in the workforce and could take up LTDI in later years, but I assume the quantity is negligible.

formulas

How large is the effect of private STDI on LTDI?

If Canadian employers had not provided private STDI during the 15 years from 2001-2014…

…there would have been 18,300 fewer LTDI recipients in 2015.

(95% confidence interval: 2,900 to 33,700)

…LTDI benefits would have been $230 million (5%) lower in 2015.

(95% confidence interval: $40 million to $410 million)

Calculating the cost of future LTDI benefits

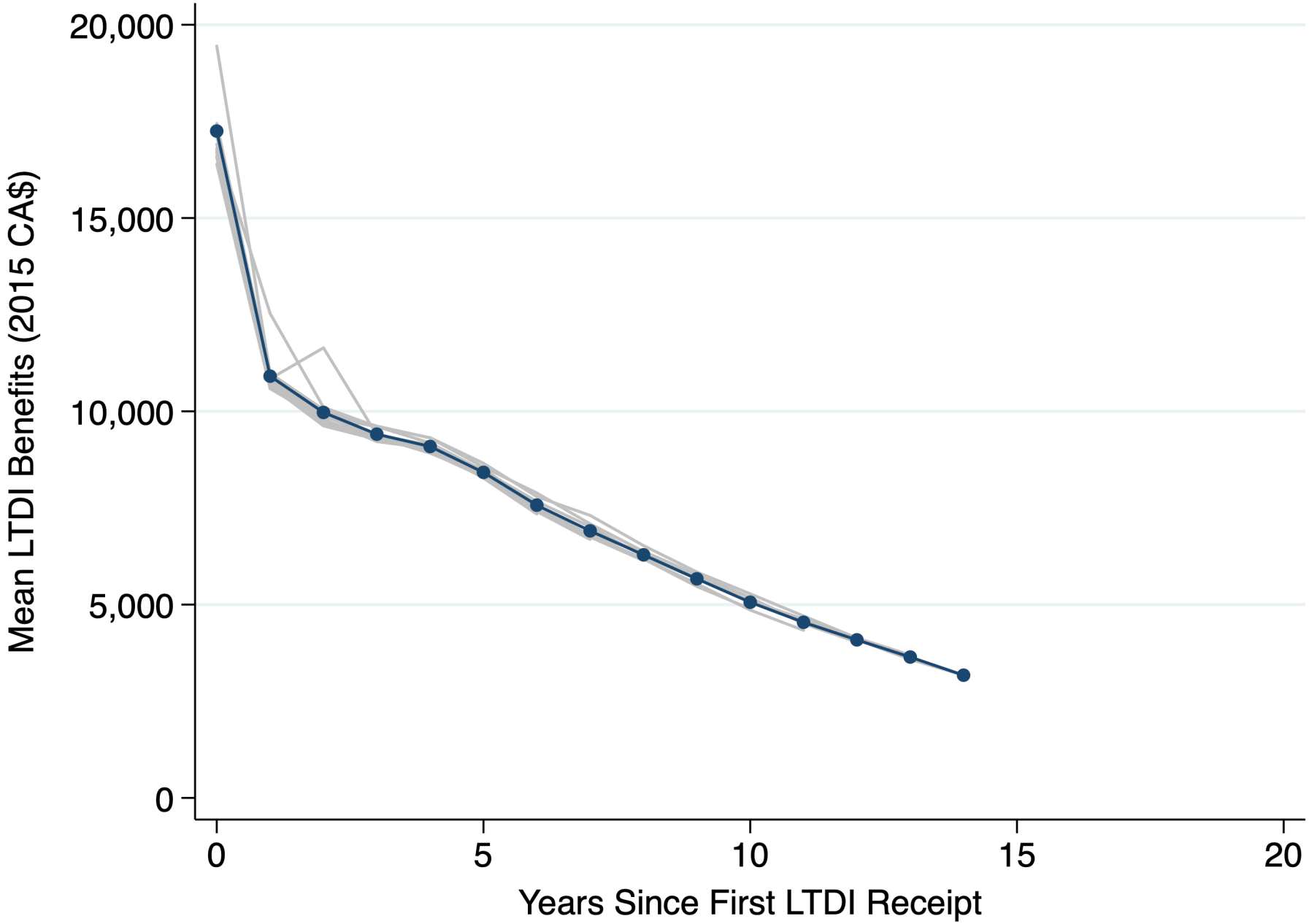
- Each worker covered by private STDI for one year decreases expected spending on EI Sickness by ~$150, as calculated by actuaries for PRP.

- Each worker covered by private STDI for one year increases expected spending on LTDI by…how much?

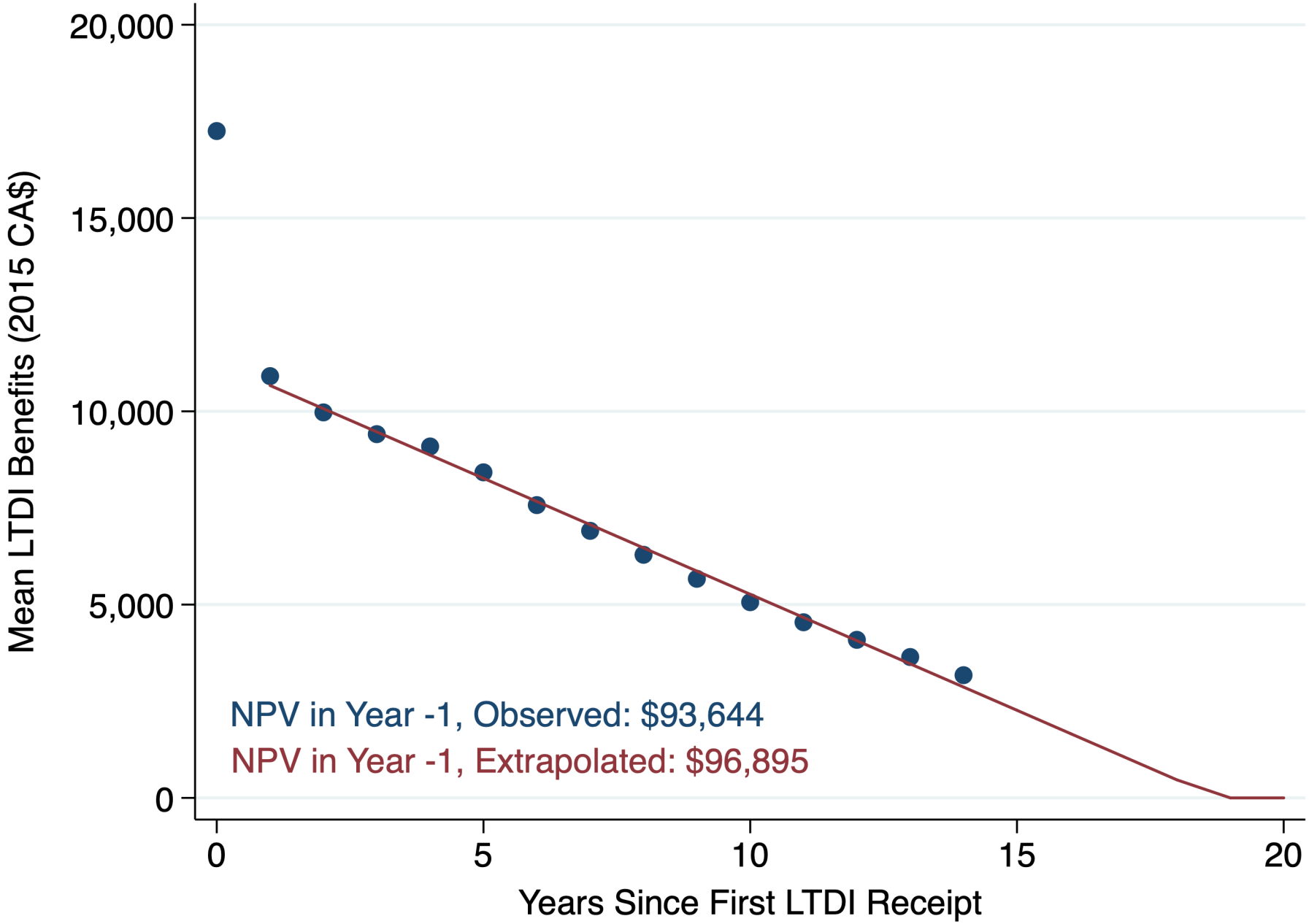
  = Change in LTDI Take-Up × Present Value of Future LTDI Benefits

- Need to make the same four assumptions as before.

Mean LTDI benefits for workers who had private STDI in prev. year



Mean LTDI benefits for workers who had private STDI in prev. year



Calculating the cost of future LTDI benefits

- Each worker covered by private STDI for one year decreases expected spending on EI Sickness by ~$150, as calculated by actuaries for PRP.

- Each worker covered by private STDI for one year increases expected spending on LTDI by **~$35** (95% confidence interval: $5 to $65)

  = 0.036 p.p. increase in annual LTDI take-up x $97,000 present value of future LTDI benefits

- A Pigouvian tax on private STDI of ~$35 per insured worker per year would internalize the negative fiscal externality on public LTDI

  - ¼ of the EI PRP rebate, which is a Pigouvian subsidy

Conclusion

Summary of Results

Quasi-experimental results:

- Private STDI increases 2-year take-up of LTDI by 0.07 pp (33%)
    - Increase in LTDI take-up caused by more generous benefits outweighs any decrease caused by greater accommodation.

Extrapolation of aggregate effect:

- Private STDI generated approx. 18,300 LTDI recipients and increased LTDI spending by approx. $230 million (5%) in 2015

- The cost of a private STDI plan in terms of future public LTDI spending is approx. $35 / insured worker / year (¼ of PRP rebate)

Policy Implications

- There are spillovers from short-term DI policy (EI Sickness and EI PRP) to long-term DI (LTDI) take-up and costs.
  - Changes to EI Sickness benefits or the EI Premium Reduction ($1.3 billion / year) would have fiscal spillovers on LTDI costs ($5 billion / year)
  - Jurisdictional spillovers: U.S. states introducing or expanding short-term DI (STDI) or paid medical leave (PFML) increase costs paid from the federal DI trust fund
- Externalities from private short-term DI plans generate economic inefficiency and inequality
  - The price of private short-term DI does not reflect its full costs
  - Implicit subsidy for private short-term DI, disproportionately held by high income workers

Appendix Slides

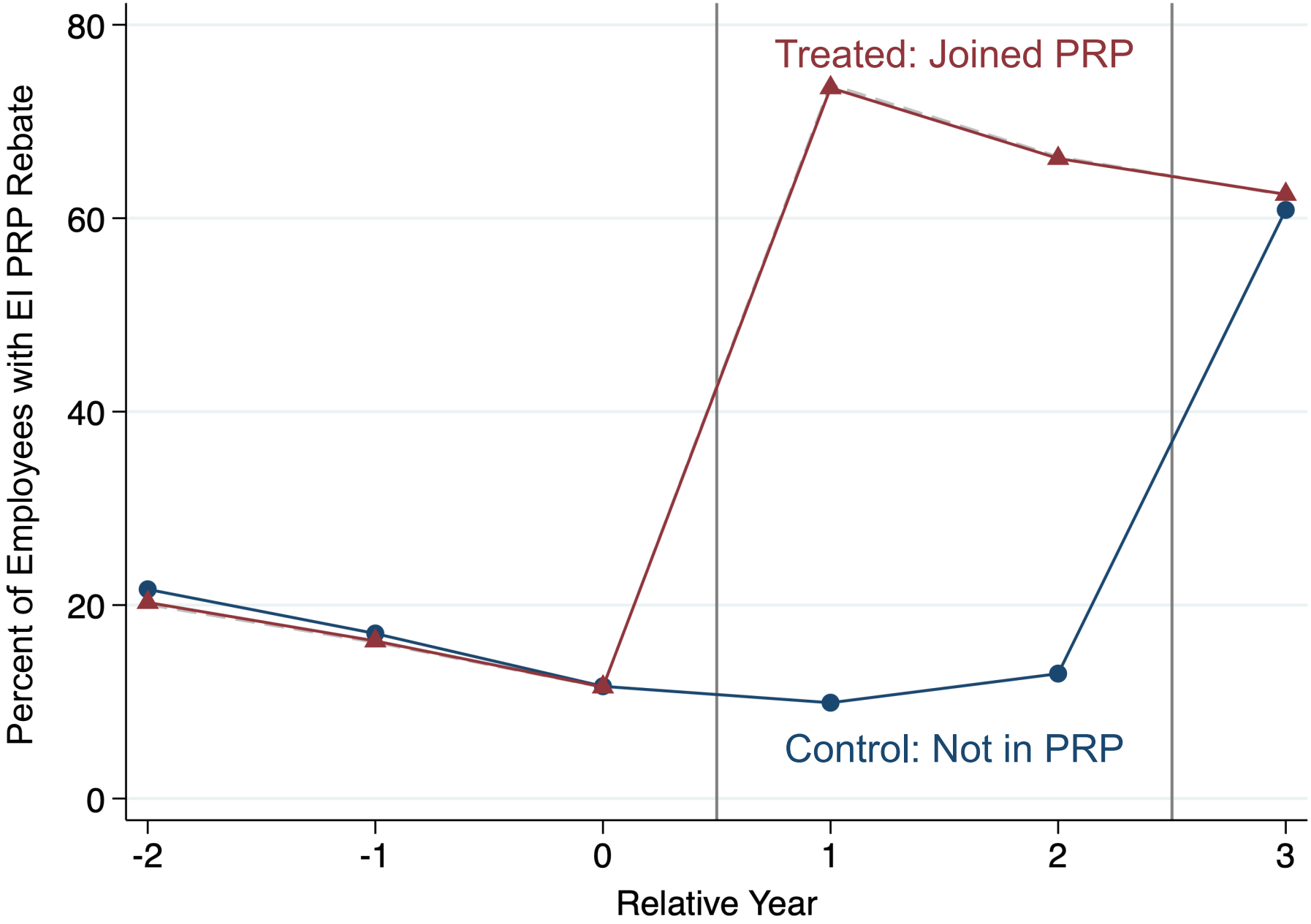
Cross-Sectional Regression Controlling for Observables

	% Receiving Public LTDI Benefits in 2011			
Private STDI Coverage in 2010	0.011 (0.003)	-0.004 (0.003)	0.145 (0.003)	0.129 (0.004)
Fixed Effects:				
Interacted Age and Sex		X	X	X
Earnings Decile in Prev. 3 years			X	X
Industry (2-digit NAICS)				X
Percent Effect	4%	-1%	73%	63%
Sample Size	11,018,864	11,018,864	11,018,864	11,018,864

back

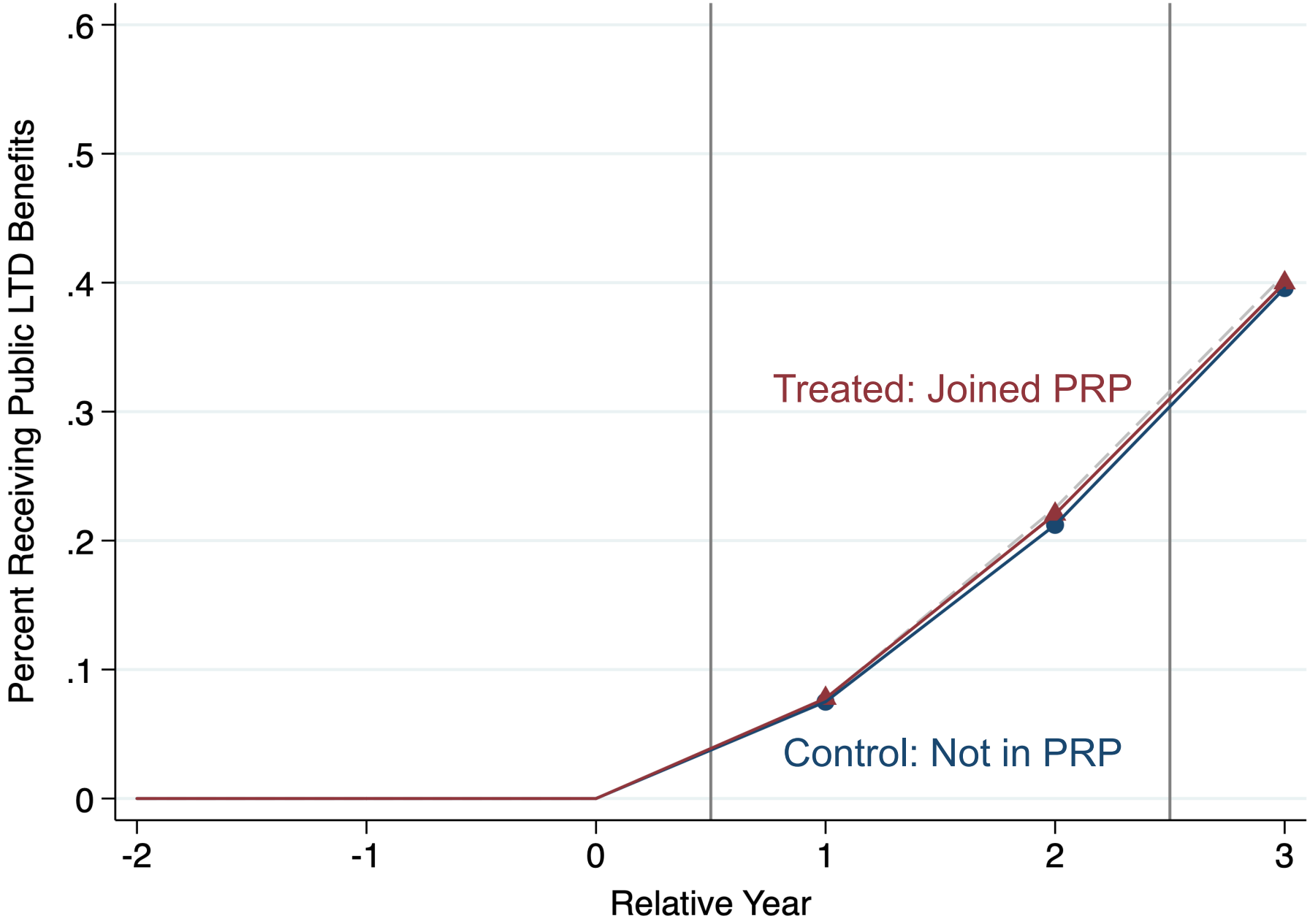
back

First Stage: Firms Joining EI PRP



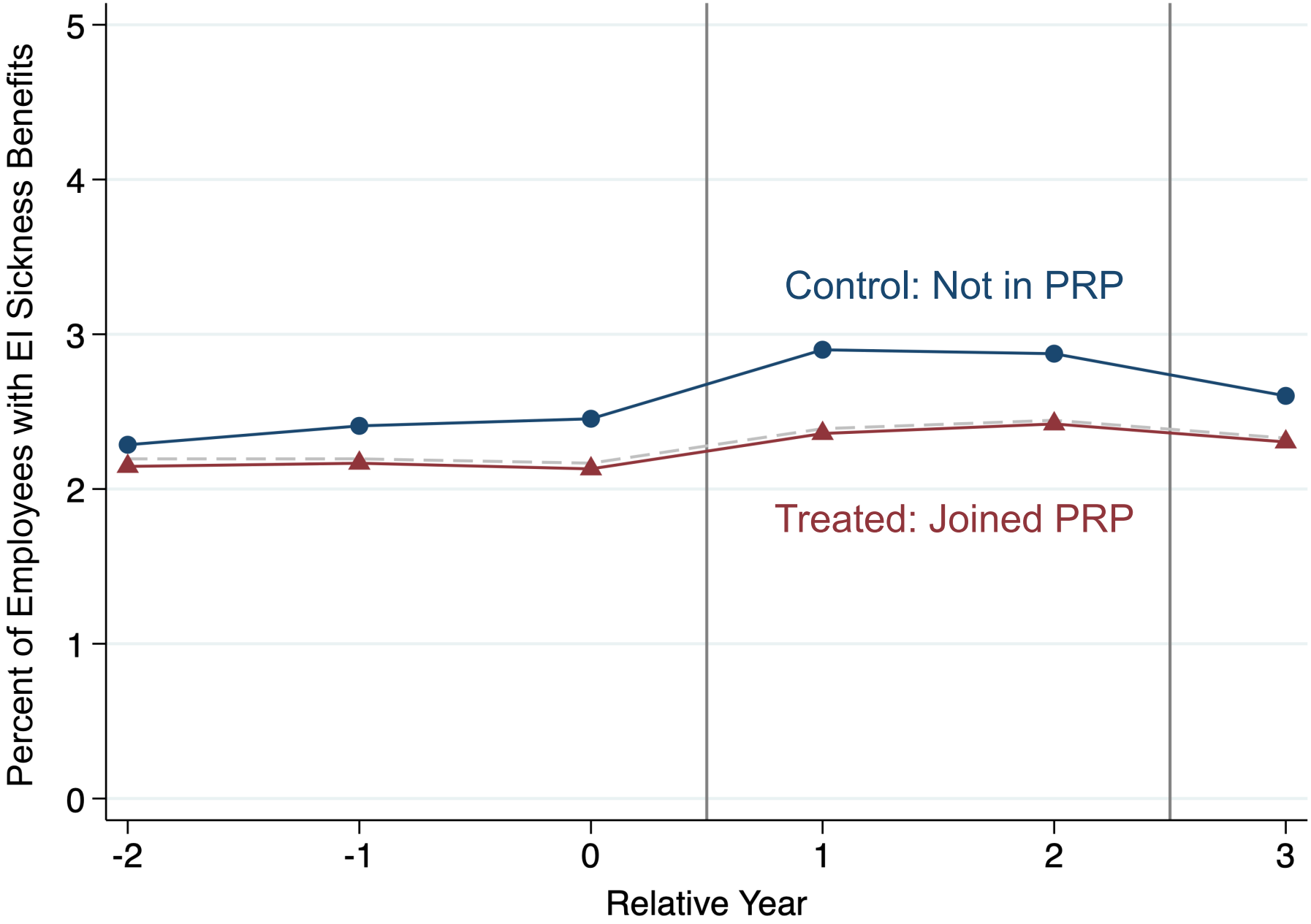
back

Little Change in CPP Disability Rates



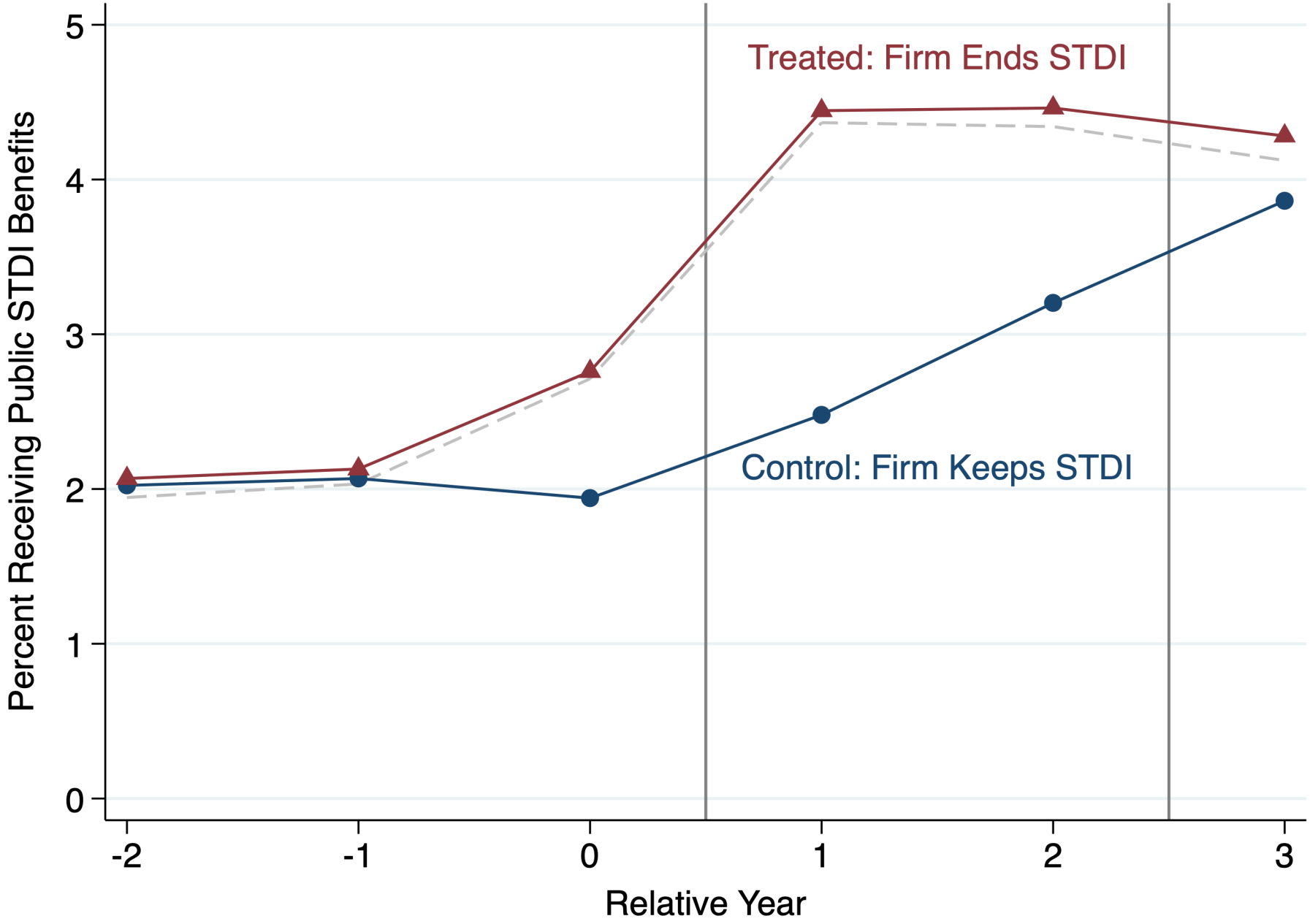
back

Little Change in EI Sickness Rates



back

EI Sickness Rates Jump When Firms End Private STDI



back

Estimated effects of firms starting private STDI are attenuated

- The timing of firms joining the EI PRP does not match the start of their private STDI plan
  - Attenuates the estimated effects, biasing them toward zero

- Private STDI plans mechanically reduce receipt of EI Sickness benefits
  - Estimated change in EI Sickness receipt using firms starting STDI is ¼ as large
  - Estimated change in private LTDI receipt using firms starting STDI is ¼ as large

→ Results are attenuated but consistent with the results of firms ***ending*** private STDI plans

back

back

Extrapolating from flows to stocks

Change in number of LTDI recipients:

$$\Delta \mathrm{N}_{2015}^{\mathrm{LTDI}} = \sum_{t=2000}^{2014} n_t \cdot \frac{\beta}{2} \cdot p_{t+1,2015}$$

Number of workers with private STDI in year *t*

Increase in annual flow onto LTDI due to private STDI

Probability someone who had private STDI in year *t* and joined LTDI in year *t+1* received benefits in 2015

Change in dollars of LTDI expenditures:

$$\Delta \mathrm{b}_{2015}^{\mathrm{LTDI}} = \sum_{t=2000}^{2014} n_t \cdot \frac{\beta}{2} \cdot p_{t+1,2015} \cdot \bar{b}_{t+1,2015}$$

…times the average amount of benefits they received in 2015

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