

Unemployment Insurance, Disability Insurance, and Workers' Compensation

131 Undergraduate Public Economics
Emmanuel Saez
UC Berkeley

OUTLINE

Chapter 14

14.1 Institutional Features of Unemployment Insurance, Disability Insurance, and Workers' Compensation

14.2 Unemployment Insurance

14.3 Disability Insurance

14.4 Workers' Compensation

INSTITUTIONAL FEATURES

Unemployment insurance, workers' compensation, and disability insurance are three of the largest social insurance programs in the United States, and they share many common features.

Unemployment insurance: A federally mandated, state-run program in which payroll taxes are used to pay benefits to workers laid off by companies.

Disability insurance: A federal program in which a portion of the Social Security payroll tax is used to pay benefits to workers who have suffered a medical impairment that leaves them permanently unable to work.

Workers' compensation: State-mandated insurance, which firms generally buy from private insurers, that pays for medical costs and lost wages associated with an on-the-job injury.

14.1

Institutional Features of Unemployment Insurance, Disability Insurance, and Workers' Compensation

Comparison of the Features of UI, DI, and WC

■ TABLE 14-2

Comparing Unemployment Insurance, Disability Insurance, and Workers' Compensation

Characteristic	UI	DI	WC
Qualifying event	Unemployment and job search	Disability	On-the-job injury
Duration	26–65 weeks	Indefinite	Indefinite (with medical verification)
Difficulty of verification	Unemployment: Easy Job search: Nearly impossible	Somewhat difficult	Very difficult
Average after-tax replacement rate	47%	60%	89%
Variation across states	Benefits and other rules	Only disability determination	Benefits and other rules

UI, DI, and WC differ along many dimensions, such as the qualifying event, the duration of benefits, the difficulty of verifying eligibility for the program, the average after-tax replacement rate, and the extent to which the program varies across states.

Unemployment Insurance

Unemployment insurance is a major social insurance program in the U.S.

Substantial size: \$50 bn/year (\$150bn/year in recent recession)

Macroeconomic importance in stabilization/stimulus

Like other social programs, triggered by an event

In this case, involuntary job loss

Controversial debate about unemployment benefits

Benefit: helps people in a time of need

Cost: reduces incentive to search for work while unemployed

What is the optimal design of UI system given this tradeoff?

Institutional Features of Unemployment Insurance

UI is a federally mandated, state-run program

Although UI is federally-mandated, each state sets its own parameters on the program.

This creates a great deal of variation across states

Useful as a “laboratory” for empirical work

⇒ UI is a heavily studied program

Financing of UI Benefits

1) UI is financed through a payroll tax on employers.

Thus, an employee will not see a deduction for UI on his or her paycheck.

This payroll tax averages 1-2% of earnings

2) UI is partially experience-rated on firms

The tax that finances the UI program rises as firms have more layoffs, but not on a one-for-one basis

Eligibility Requirements and Benefits

- 1) Individuals must have earned a minimum amount over the previous year.
- 2) Unemployment spell must be a result of a layoff, rather than from quitting or getting fired for cause (easy to check)
- 3) Individual must be actively seeking work and willing to accept a job comparable to the one lost (hard to check)

These eligibility requirements mean that not all of the unemployed actually collect benefits.

Even among eligible, 1/2 do not take up the UI benefit (Lack of information about eligibility, stigma from collecting a government handout, or transaction costs)

UI Benefits

UI benefits are a function of previous earnings

These benefits vary by state.

The replacement rate is the amount of previous earnings that is replaced by the UI system.

$$R = B/W$$

Replacement rates vary from 35% to 55% of earnings, and UI is treated as taxable income.

Figure 1

Unemployment Benefits in Michigan



UI Benefits Duration

In general, one can collect UI for 6 months.

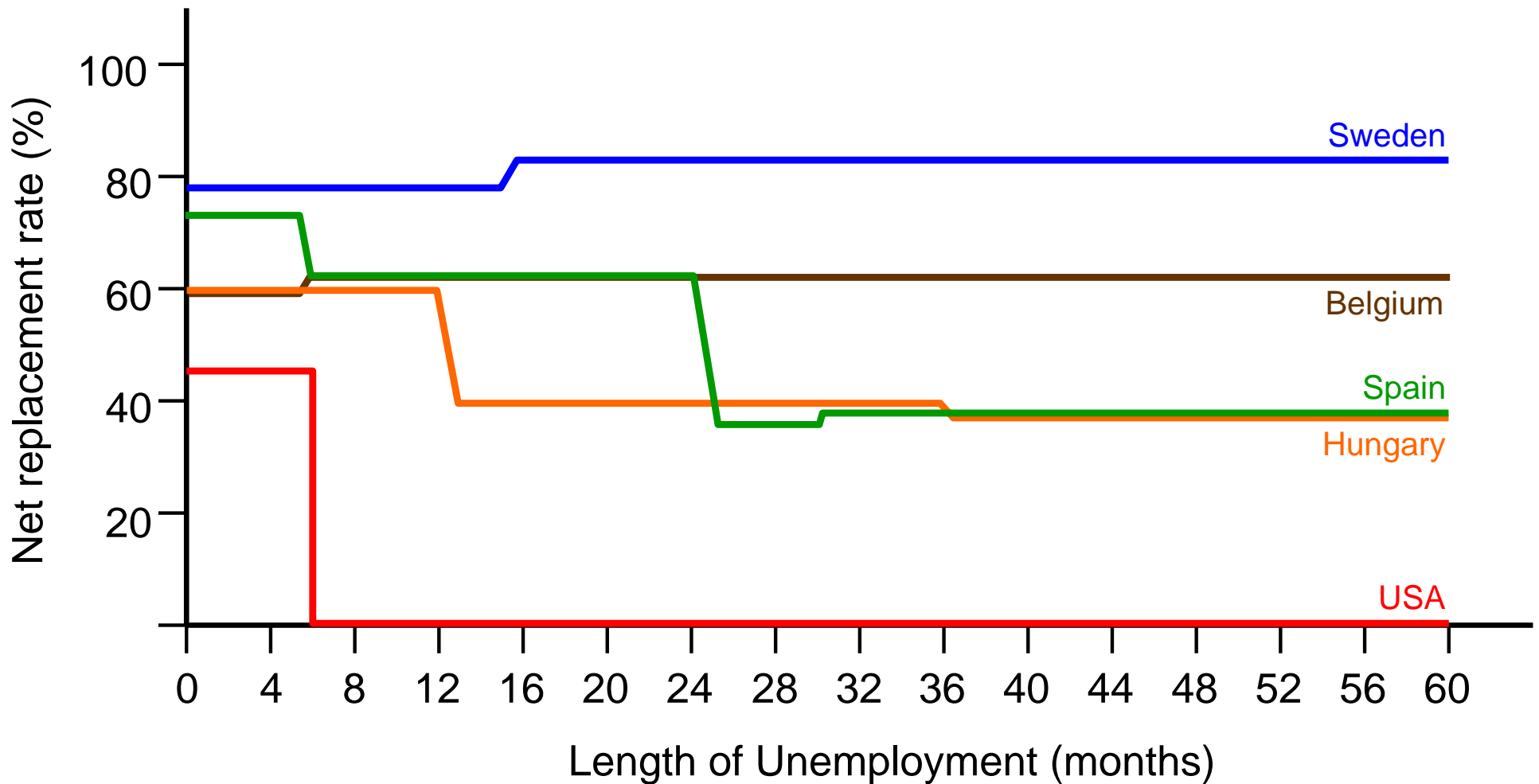
In recessions, benefits are automatically extended to 9 months or 12 months

In deep recessions, benefits can be further extended (23 months in 2008-12)

Duration of UI benefits typically much higher in European countries

Figure 2

Net Replacement Rates Over a Five-Year Period For a One-Earner Couple With Two Children



Analysis of Optimal Unemployment Insurance

Which system is the best?

First need to define what we mean by “best”—what is the objective function?

Typical objective considered by economists: maximize agents welfare

In this case, because there is uncertainty, welfare is given by expected utility

Use a formal mathematical model to tackle the problem and get a number for the optimal benefit

Expected Utility Model

Individuals expected utility:

$$EU = (1 - p)u(c_e) + pu(c_u) = (1 - p)u(w - t) + pu(b)$$

p : probability of being unemployed

c_e = consumption when employed,

c_u = consumption when unemployed

w = wage when working

t = tax used to finance program,

b = UI benefit

Government needs to balance budget (taxes fund benefits):

$$t = (p/(1 - p))b$$

Optimal UI with no moral hazard

No moral hazard means that p is not affected by UI

Plugging in govt. budget constraint, rewrite individuals expected utility as:

$$EU = (1 - p)u(w - (p/(1 - p))b) + pu(b)$$

Governments problem: find b that maximizes EU .

Optimal benefit b^* will be b such that: $c_u = c_e$

This is **full insurance** (as we saw earlier in class)

Optimal UI with moral hazard

With moral hazard, p increases with b as more generous benefits deter job search and hence increase unemployment

Government now chooses b to maximize EU but taking into account that p is a function of b in the budget constraint

$$EU = (1 - p)u(w - [p(b)/(1 - p(b))]b) + pu(b)$$

Get new formula:

$$\frac{u'(c_u) - u'(c_e)}{u'(c_e)} = \frac{1}{1 - p} \varepsilon_{p,b} \text{ with } \varepsilon_{p,b} = \frac{b}{p} \cdot \frac{dp}{db}$$

$\varepsilon_{p,b} > 0$ is the elasticity of unemployment rate with respect to benefits (captures size of moral hazard effects)

Now $0 < c_u < c_e < w$: partial insurance is optimum. Optimum level increases with curvature of $u(\cdot)$ but decreases with elasticity $\varepsilon_{p,b}$.

Empirical Estimation of Effects of UI

Moral hazard in UI is thought to manifest itself in the duration of the unemployment spell.

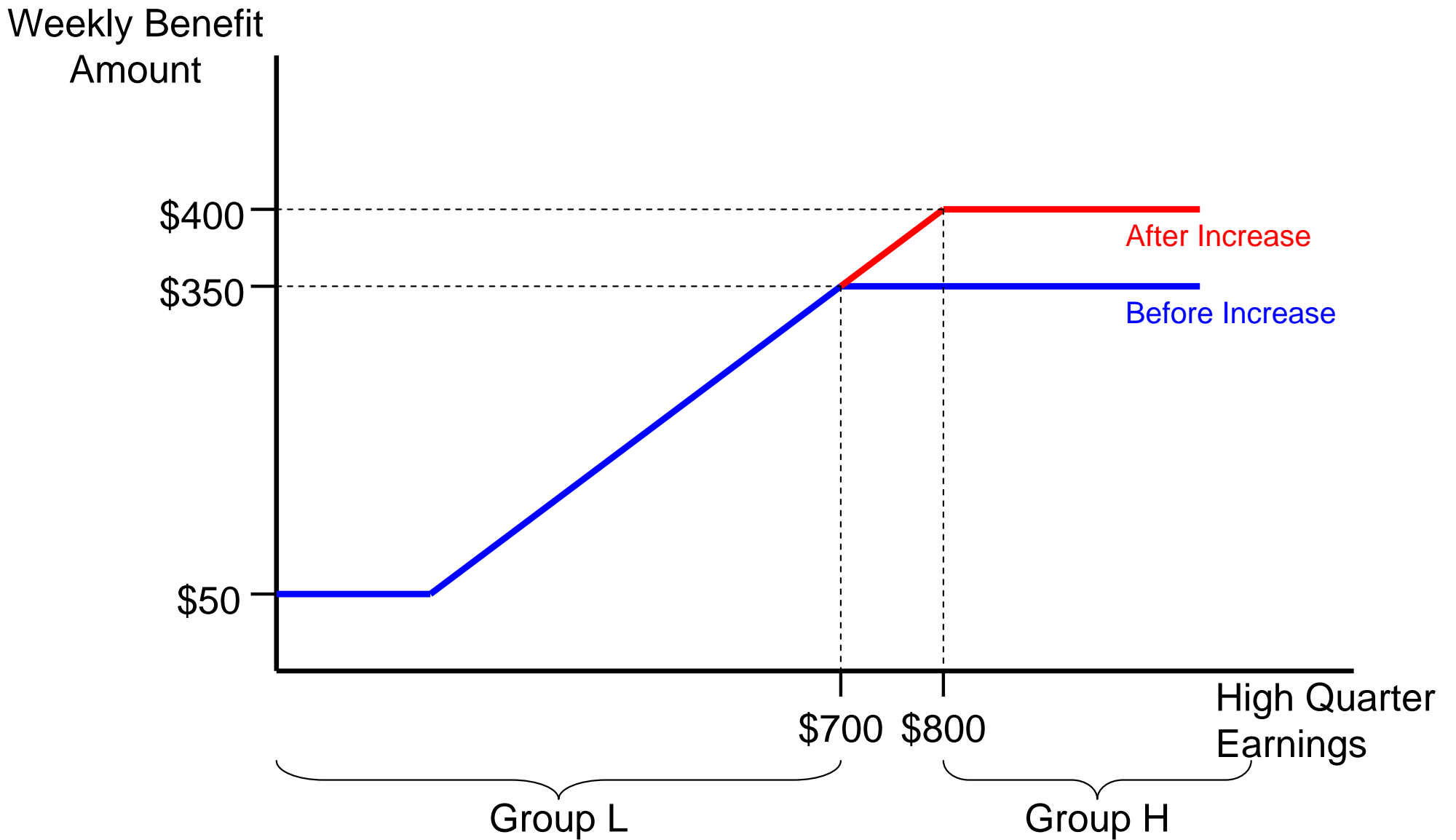
Economists ask whether the unemployed find jobs more slowly when benefits are higher.

Key challenge: need to use quasi-experiments to identify these effects

One common empirical approach (Meyer 1990): difference-in-difference

Exploit changes in UI laws that affect a “treatment” group and compare to a “control” group

Figure 3



Empirical Estimation of Effects of UI: Evidence

Meyer (1990) and many others implement this method using data on unemployment durations in the U.S. and state-level reforms

General finding: benefit elasticity of 0.4-0.6

10% rise in unemployment benefits leads to about a 4-6% increase in unemployment durations.

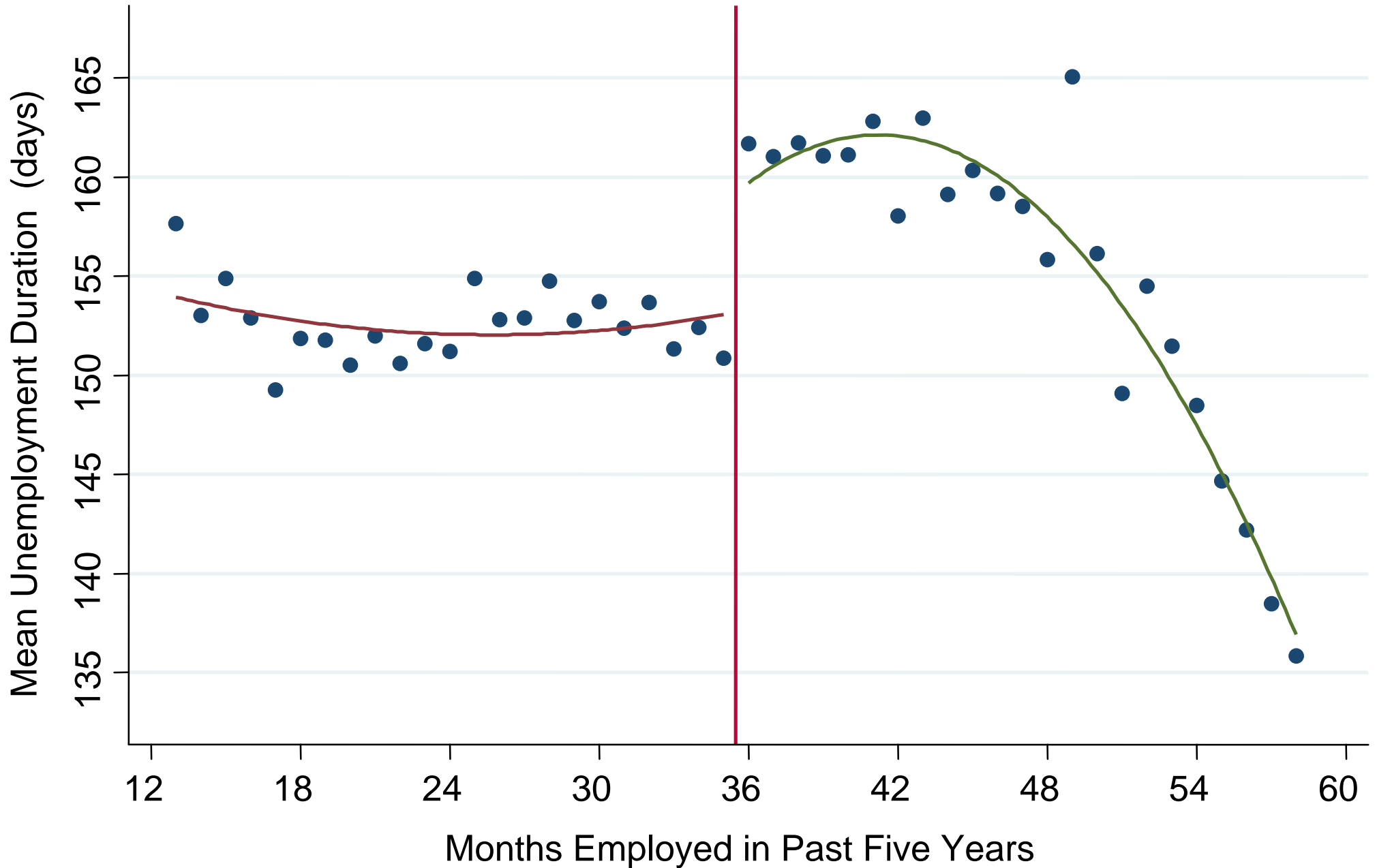
More recent empirical approach: **regression discontinuity**

Card-Chetty-Weber (2007) use the fact that in Austria, you get a longer benefit when you have been employed for 36+ months in last 5 years

Can look at duration of unemployment based on how long you have worked in last 5 years

Card, Chetty, Weber (2007)

Effect of Benefit Extension on Unemployment Durations



Evidence on Consumption-Smoothing

Difference-in-difference strategy has been used to examine how UI benefits affects consumption

Gruber (1997) finds that consumption falls on average when people lose their job by about 10-15%

\$1 increase in UI benefits increases consumption by 30 cents

Much less than 1-1 because savings behavior changes, spousal labor supply, borrowing from friends, etc.

Does UI have Long-Term Benefits?

Another potential benefit of UI, neglected in simple model above: improvements in **match quality**

Are people forced to take worse jobs because they have to rush back to work to put food on the table?

E.g. engineer starts working at McDonalds.

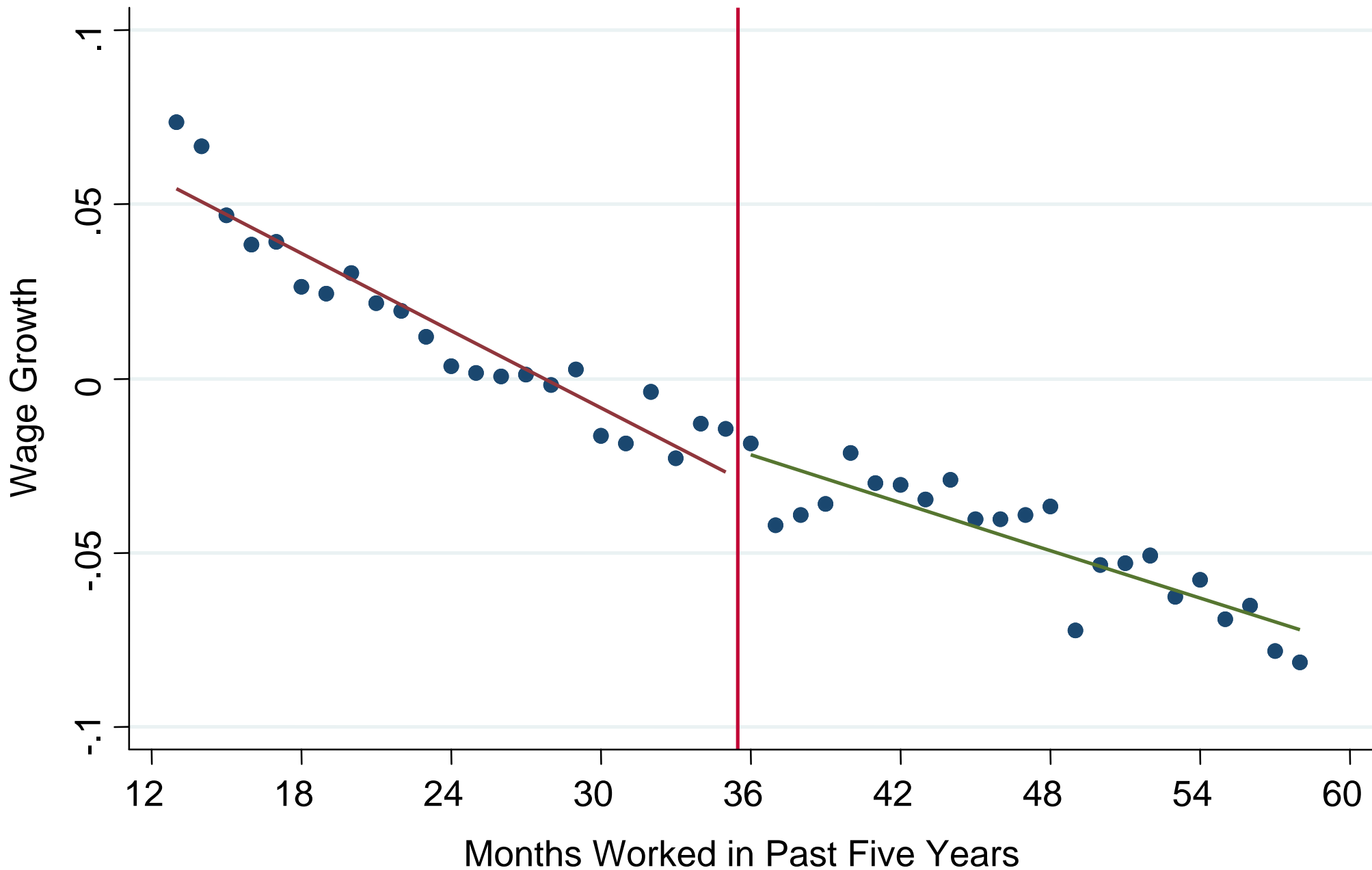
Can examine this using similar data

Look at whether people who got higher benefits and took longer to find a job are better off years later

Card-Chetty-Weber (2007) exploit again the **regression discontinuity** and find no long-term match benefit on subsequent wage or subsequent job duration

Card, Chetty, Weber (2007)

Effect of Extended Benefits on Subsequent Wages



Card, Chetty, Weber (2007)

Effect of Extended Benefits on Subsequent Job Duration



Summary of Empirical Findings on UI

1. Higher benefit level \Rightarrow longer unemployment durations
(moral hazard cost)

2. Higher benefit level \Rightarrow more consumption while unemployed
(consumption smoothing benefit)

3. UI benefits have no beneficial effects on long-term job outcomes

\Rightarrow Model implies that providing some UI is desirable but UI replacement rate should be only around 50% based on those empirical findings

UI and Firm Behavior: Experience Rating

Effect of UI on firms comes from experience rating

Perfect experience rating for firms: if firm A lays a person off, firm A pays taxes to make up for the costs firm A imposes on the UI system

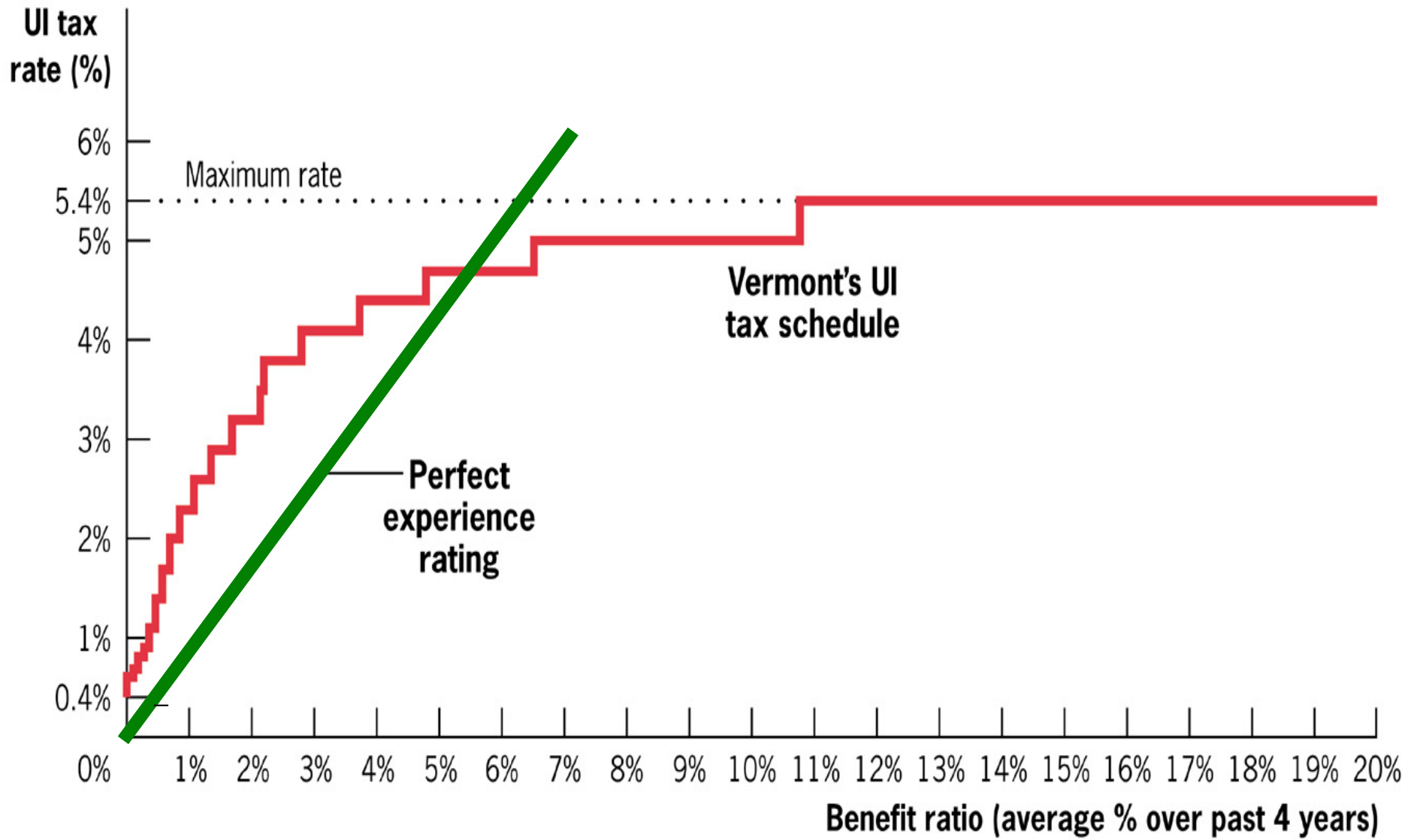
Employers with a lot of layoffs get taxed more

In practice, we have partial experience rating

Firm does not fully pay an additional tax each time it lays off a worker.

Payroll taxes rise less than one-for-one with layoffs because of cap on UI tax.

Figure 5



benefit ratio = total UI benefit paid divided by payroll.

Partial Experience Rating and Temporary Layoffs

Partial experience rating subsidizes firms with high layoff rates.

Firms and workers may make a joint decision whether to place the worker on temporary layoff, with a promise of being hired back later.

UI system makes this a partially paid vacation.

With partial experience rating, government ends up sharing in the cost of the vacation.

Experience Rating in Canada

UI systems in other countries create even more moral hazard inefficiency on the firm side than in the U.S.

In Canada, UI is financed through a flat payroll tax, unrelated to actual layoff behavior.

In Canada, workers only have to work 10 weeks to qualify for 42 weeks of UI with a replacement rate of 60%.

Example: Distortions in Canadian Fishing

Consequences of imperfect experience rating:

You and four friends buy a fishing boat, and can catch \$40,000 in fish over 10 weeks, or \$8,000 per person.

In the absence of UI, \$8,000 is not enough for you or your friends to want to operate this business.

With Canada's UI system, you work for 10 weeks and are then "laid off". Your earnings were \$800 per week, of which 60% is replaced by UI for the remainder of the year.

Your benefit from UI is $0.6 * 800 * 42$, or \$20,160.

With UI, each person gets \$28,160 for only 10 weeks of work.

UI induces inefficiently large number of fisherman, construction workers, etc.

Partial Experience Rating and Layoffs: Evidence

Empirical studies have examined state systems with different degrees of experience rating using difference-in-difference methods

They find that partial experience rating increases the rate of temporary layoffs.

Partial experience rating alone can account for one-third of all temporary layoffs in the U.S.

The Benefits of Partial Experience Rating

What is the benefit of partial experience rating?

Fully experience rated UI would “hit firms while they are down.”

Similar to “consumption smoothing” for workers

Conceptually, tradeoff is similar to that we discussed for individual workers

But for firms, smoothing benefits are weaker

Firms have collateral - should be easier to get a loan

Most economists agree that UI should be fully experience rated

DISABILITY INSURANCE

Disability is conceptually close to retirement: some people become unable to work before old age (due to accidents, medical conditions, etc.)

All advanced countries offer public disability insurance almost always linked to the public retirement system

Disability insurance allows people to get retirement benefits before the “Early Retirement Age” if they are unable to work due to disability

US DISABILITY INSURANCE

- 1) Federal program funded by OASDI payroll tax, pays SS benefits to disabled workers under retirement age.
- 2) Program started in 1956 and became more generous over-time (age 50+ condition removed, definition of disability liberalized, replacement rate has grown)
- 3) Eligibility: Medical proof of being unable to work for at least a year, Need some prior work experience, 5 months waiting period with no earnings required (screening device)
- 4) Social security examiners rule on applications. Appeal possible for rejected applicants. Imperfect process with big type I and II errors (Parsons AER'91) ⇒ Scope for Moral Hazard
- 5) DI tends to be an absorbing state (very few go back to work)

US DISABILITY INSURANCE

- 1) In 2010, about 8m DI beneficiaries (not counting widows+children), about 5% of working age age 20-64 population
- 2) Very rapid growth: In 1960, less than 1% of working age pop was on DI
- 3) Growth particularly strong during recessions: early 90s, late 00s

Key question: Are DI beneficiaries unable to work? or are DI beneficiaries not working because of DI.

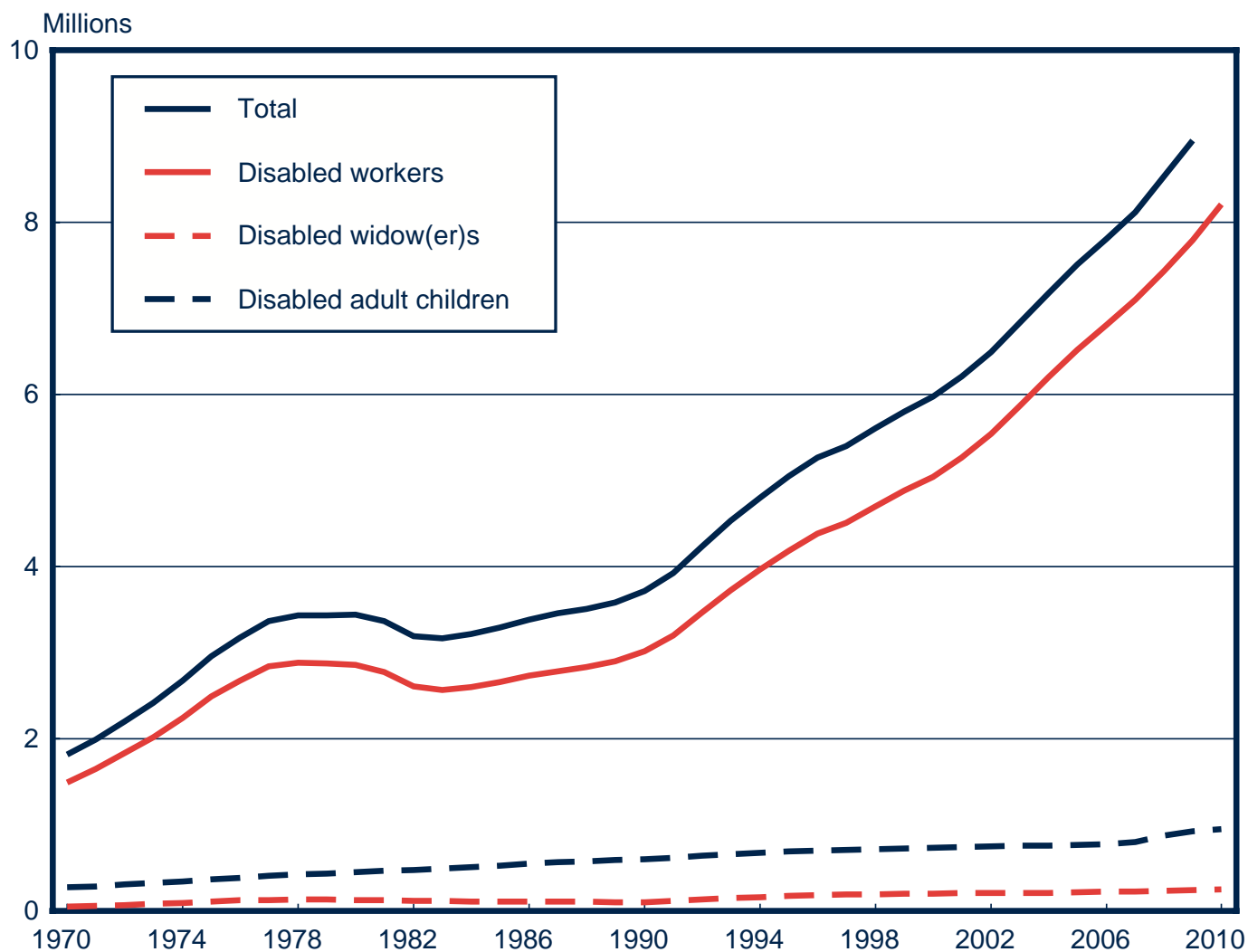
Beneficiaries in Current-Payment Status

Chart 2.

Source: SSA DI annual report

All Social Security disabled beneficiaries in current-payment status, December 1970–2010

The number of disabled workers grew steadily until 1978, declined slightly until 1983, started to increase again in 1984, and began to increase more rapidly beginning in 1990. The growth in the 1980s and 1990s was the result of demographic changes, a recession, and legislative changes. The number of disabled adult children has grown slightly, and the number of disabled widow(er)s has remained fairly level. In December 2010, slightly over 8.2 million disabled workers, over 949,000 disabled adult children, and just under 245,000 disabled widow(er)s received disability benefits.

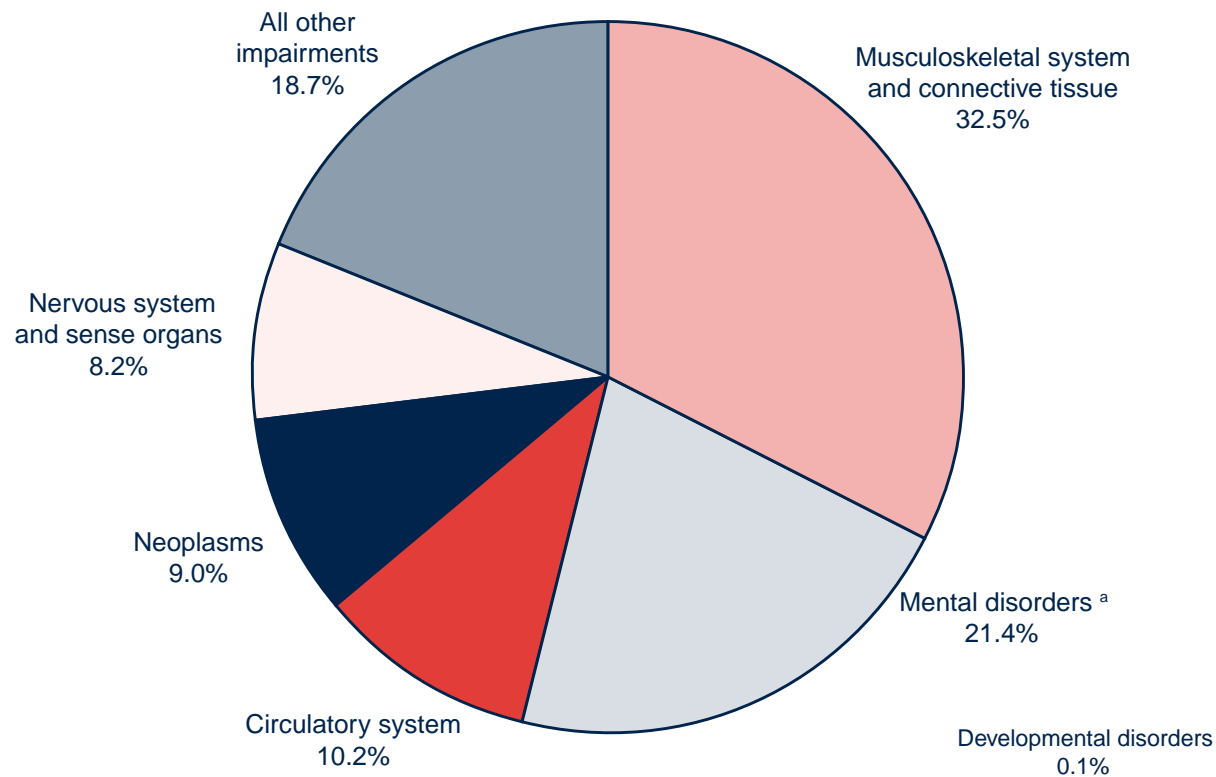


SOURCE: Table 3.

Chart 10.
Disabled-worker awards, by selected diagnostic group, 2010

Source: SSA DI annual report

In 2010, 1,026,988 disabled workers were awarded benefits. Among those awardees, the most common impairment was diseases of the musculoskeletal system and connective tissue (32.5 percent), followed by mental disorders (21.4 percent), circulatory problems (10.2 percent), neoplasms (9.0 percent), and diseases of the nervous system and sense organs (8.2 percent). The remaining 18.7 percent of awardees had other impairments.



US DISABILITY INSURANCE

Detecting disability is challenging, particularly for back injuries and mental health conditions

One way to quantify difficulty in assessment: audit study

Take a set of disability claims that was initially reviewed by a state panel

One year later, resubmit them to the panel as anonymous new claims.

Compare decisions on the **same** cases

⇒ Substantial evidence of Type I errors (incorrect rejection of a disabled person) and Type II errors (letting a non-disabled person on the program)

TABLE 1—REASSESSMENTS OF INITIAL
SOCIAL SECURITY DETERMINATIONS

A. *Bureau of Disability Insurance Review One Year
After Initial Determination (Percentages):*

BDI assessment	Initial determination	
	Allowance	Denial
Allowance	78.8	21.1
Denial	22.5	77.5

Note: The sample sizes are 250 initial allowances and 248 initial denials.

Source: Smith and Lilienfeld (1971 p. 195).

Nonparticipation and Recipency Rates, Men 45-54 Years Old



Source: Parsons 1984 Table A1

DI Empirical Effects: Observational Studies

Parallel growth of DI recipients and non-participation rates among men aged 45-54 but causality link not clear

Cross-Sectional Evidence (Parsons '80): Does potential DI replacement rate have an impact on labor force participation (LFP) decision?

Uses cross-sectional variation in potential replacement rates

Survey data on men aged 45-59 from 1966-69

OLS regression

$$NLFP_i = \alpha + \beta DIreprate_i + \varepsilon_i$$

Large effect that can fully explain decline in LFP among men 45+

DI EMPIRICAL EFFECTS: OBSERVATIONAL STUDIES

Issues with Cross-Sectional Evidence:

- 1) $DIreprate_i$ depends on wages (higher for low wage earners) and likely to be correlated with ε_i (likelihood to become truly disabled)
- 2) Impossible to control non-parametrically for wages in regression because all variation in $DIreprate_i$ is due to wages (destroys identification)
- 3) Bound AER'89 replicates Parson's regression on sample that never applied to DI and obtains similar effects implying that the OLS correlation not driven by UI

DI EMPIRICAL EFFECTS: REJECTED APPLICANTS

Bound AER'89 proposes a technique to bound effect of DI on LFP rate

Uses data on LFP on (small sample of) rejected applicants as a counterfactual

Idea: If rejected applicants do not work, then surely DI recipients would not have worked \Rightarrow Rejected applicants' LFP rate is an upper bound for LFP rate of DI recipients absent DI

Results: Only 30% of rejected applicants return to work and they earn less than half of the mean non-DI wage

\Rightarrow at most 1/3 of the trend in male LFP decline can be explained by shift to DI

Von Waechter-Manchester-Song AER'11 replicate Bound using full pop SSA admin data and confirm his results

TABLE 2—EMPLOYMENT, EARNINGS, AND OTHER CHARACTERISTICS OF REJECTED DISABILITY INSURANCE APPLICANTS

	1972			1978		
	Population	Rejected Applicants	Beneficiaries	Population	Rejected Applicants	Beneficiaries
Labor Supply						
Percent Employed	77.7	32.6	3.2	69.3	28.7	2.3
Percent Worked 71/77	91.9	45.0	7.5	86.7	40.4	5.5
Percent Full Year (≥ 50 Weeks) ^a	76.8	47.4	31.4	83.5	41.2	22.2
Percent Full Time (≥ 35 Hours) ^a	95.4	75.9	25.0	92.4	79.6	38.3
Earnings Among Positive Earners						
Median Annual Earnings, 71/77 ^b	\$9000	\$4000	\$700	\$14000	\$5300	\$1000

Moral Hazard in Disability Insurance

Bound AER'89 evidence is suggestive that DI is not solely responsible for reduction in labor supply over time

But does not tell us how big an effect DI has

Strategy 3: Difference-in-difference

Cannot be implement in U.S.

Gruber (2000): studies Candian experience, comparing Quebec with the rest of Canada

1987: reform that sharply increased benefit in rest of Canada while Quebec was unchanged

Finds an elasticity of labor force participation w.r.t. DI benefit rate of 0.2

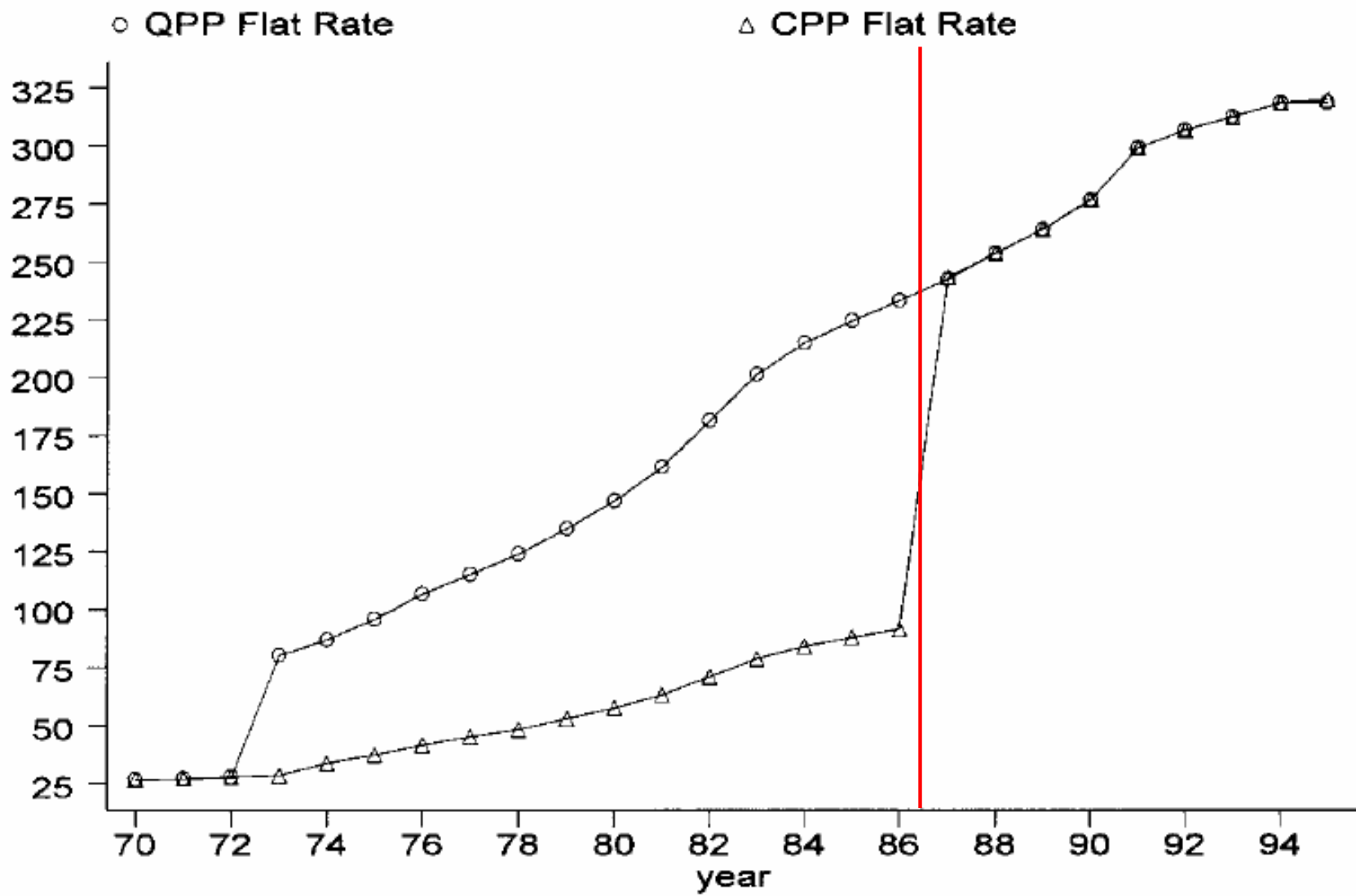


FIG. 1.—Flat-rate portion in Quebec and the rest of Canada

Source: Gruber 2000

TABLE 1
MEANS

	CPP		QPP		DIFFERENCE IN DIFFERENCE (5)
	Before (1)	After (2)	Before (3)	After (4)	
Benefits	5,134	7,776	6,878	7,852	1,668 (17)
Replacement rate	.245	.328	.336	.331	.088 (.003)
Not em- ployed last week	.200	.217	.256	.246	.027 (.013)
Married?	.856	.856	.817	.841	-.024
Any kids < 17?	.367	.351	.354	.336	.002
Less than 9 years of education	.303	.274	.454	.421	.004

Moral Hazard vs. Benefits of DI

Gruber study finds an elasticity of labor force participation w.r.t. DI benefit rate of 0.2

Important to note that this is not in itself evidence that DI is “bad”

May simply be helping people who have a very high disutility of labor and were forced to work to survive

This is why it is critical to compare costs of taking people out of labor force with benefits (relieving need to work for those who are disabled)

No good evidence on latter issue yet \Rightarrow unclear whether DI benefit is too high or low.

Workers Compensation: Institutional Features

Workers compensation is insurance for injuries on the job, mainly temporary injuries that prevent work (short-term)

Workers Compensation is state-level program

Two components: medical and indemnity

Indemnity payment replaces roughly two-thirds of lost wages.

Unlike UI, payments are untaxed, leading to a higher replacement that is near 90% on average.

Substantial variation across states in benefit levels

Table 1**Maximum Indemnity Benefits (2003)**

State	Type of permanent impairment					Temporary Injury (10 weeks)
	Arm	Hand	Index finger	Leg	Foot	
California	\$108,445	\$64,056	\$4,440	\$118,795	\$49,256	\$6,020
Hawaii	180,960	141,520	26,800	167,040	118,900	5,800
Illinois	301,323	190,838	40,176	276,213	155,684	10,044
Indiana	86,500	62,500	10,400	74,500	50,500	5,880
Michigan	175,657	140,395	24,814	140,395	105,786	6,530
Missouri	78,908	59,521	15,305	70,405	52,719	6,493
New Jersey	154,440	92,365	8,500	147,420	78,200	6,380
New York	124,800	97,600	18,400	115,200	82,000	4,000

Workers Compensation (WC): Institutional Features

1) Workers comp is a mandated benefit; no explicit tax but firms required by law to provide this benefit to workers

Most firms choose to buy coverage from private insurers

Premiums are more tightly experience rated than UI because they are determined by private sector

Insurance companies charge high-risk firms more.

2) Important feature of WC: no-fault insurance.

When there is a qualifying injury, WC benefits paid regardless of whether the injury was the worker's or the firm's fault.

Idea: reduce inefficiency of tort system (legal costs) by having fixed rules and not worrying about liability

Moral Hazard in Workers Compensation

Moral hazard in WC can manifest itself in reported injuries, injury durations, and types of injuries reported.

E.g. easier to report back pain—very hard to verify

Huge issue in CA—companies pay very high workers comp rates

Schwarzenegger reform in 2004 cut benefits sharply, claiming to reduce injuries and “open CA for business”

Is it true that there is substantial moral hazard?

Again, consider several pieces of evidence

Strategy 1: Timing of injuries. “Monday effect” (faking injuries during the week-end into work injuries)

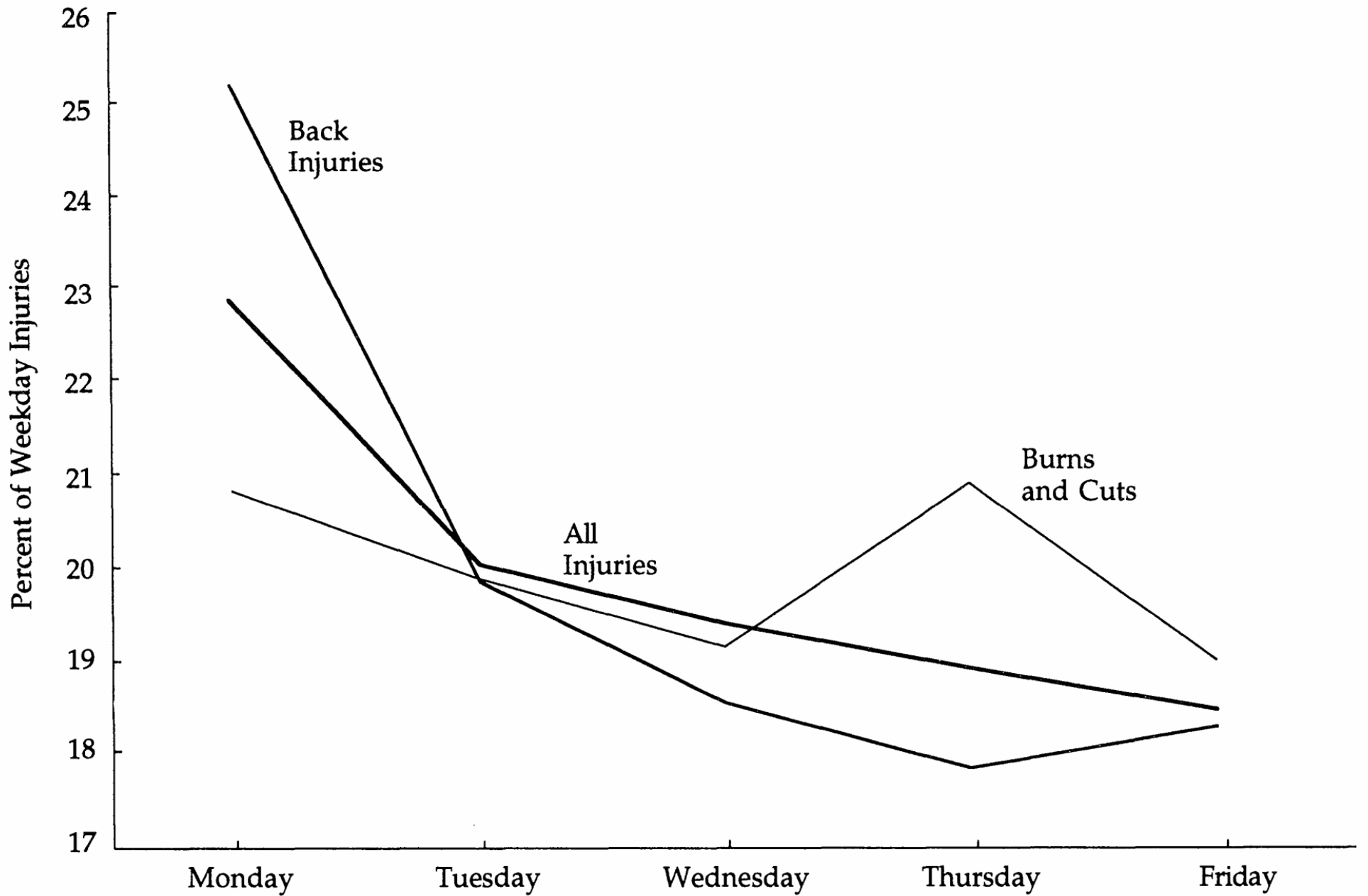


Figure 1. Distribution of Weekday Injuries.

Moral Hazard in Workers Compensation

Strategy 2: examine effect of workers comp benefit levels on durations using a diff-in-diff strategy (Meyer, Viscusi, Durbin 1995)

Reforms in Kentucky and Michigan that increased benefits for high-earning workers (but not low-earning workers) in late 1980s

Compare changes in injury durations and medical costs for high-earners vs. low earners in those states before and after reform

Variable	Kentucky			Michigan		
	Before increase (1)	After increase (2)	Percentage change (3)	Before increase (4)	After increase (5)	Percentage change (6)
Maximum benefit (\$)	131.00	217.00	65.65	181.00	307.00	69.61
Replacement rate, high earnings (percent)	32.70 (0.25)	51.02 (0.37)	56.02 (1.65)	30.01 (0.35)	44.15 (0.48)	47.14 (2.33)
Replacement rate, low earnings (percent)	66.42 (0.20)	66.66 (0.22)	0.36 (0.44)	66.64 (0.24)	66.35 (0.30)	-0.45 (0.58)

Source: Meyer, Viscusi, Durbin 1995

TABLE 4—KENTUCKY AND MICHIGAN: DURATION AND MEDICAL COSTS OF TEMPORARY TOTAL DISABILITIES DURING THE YEARS BEFORE AND AFTER BENEFIT INCREASES

Variable	High earnings		Low earnings		Differences		Difference in differences
	Before increase (1)	After increase (2)	Before increase (3)	After increase (4)	[(2)–(1)] (5)	[(4)–(3)] (6)	[(5)–(6)] (7)
Mean duration (weeks)							
Kentucky	11.16 (0.83)	12.89 (0.83)	6.25 (0.30)	7.01 (0.41)	1.72 (1.17)	0.76 (0.51)	0.96 (1.28)
Michigan	14.76 (2.25)	19.42 (2.67)	10.94 (1.09)	13.64 (1.56)	4.66 (3.49)	2.70 (1.90)	1.96 (3.97)
Median duration (weeks)							
Kentucky	4.00 (0.14)	5.00 (0.20)	3.00 (0.11)	3.00 (0.12)	1.00 (0.25)	0.00 (0.16)	1.00 (0.29)
Michigan	5.00 (0.45)	7.00 (0.67)	4.00 (0.22)	4.00 (0.28)	2.00 (0.81)	0.00 (0.35)	2.00 (0.89)
Median medical cost (dollars)							
Kentucky	393.51 (19.29)	411.49 (22.72)	238.96 (8.48)	254.40 (9.11)	17.98 (29.80)	15.44 (12.44)	2.55 (32.30)
Michigan	689.73 (77.30)	765.00 (134.53)	390.63 (32.80)	435.00 (33.09)	75.27 (155.16)	44.38 (46.59)	30.89 (162.00)

Source: Meyer, Viscusi, Durbin 1995

Moral Hazard in Workers' Compensation

Result: 10% increase in WC benefit raises duration of injury by 4%

Again, need to weigh this against benefits to reach policy conclusions

Give people more time to heal after injury without rushing them back to work

Higher consumption while out of work

No evidence yet on these issues

CONCLUSION

Individuals clearly value the consumption smoothing provided by social insurance programs.

In each case there are significant moral hazard costs associated with the provision of the insurance.

Empirical analyses of all three programs can be used to inform policy makers' decisions as program reforms move forward.