Lecture 11: Unemployment Insurance, Disability Insurance, and Workers' Compensation

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INSTITUTIONAL FEATURES

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

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

Disability insurance (DI): 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 (WC): 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.

Comparison of the Features of UI, DI, and WC

Characteristic	UI	DI	WC
Qualifying Event	Job loss, job search	Disability	On-the-job injury
Duration	26-65 weeks	Indefinite	Indefinite (if verified)
Difficulty of verification	Job loss: easy Search: 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

Unemployment Insurance

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

Substantial size: $50 bn/year in normal times ($150bn/year during Great 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

$\Rightarrow$ UI is a heavily studied program

Financing of UI Benefits

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

$\Rightarrow$ 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

$\Rightarrow$ 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, 50% do not takeup 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

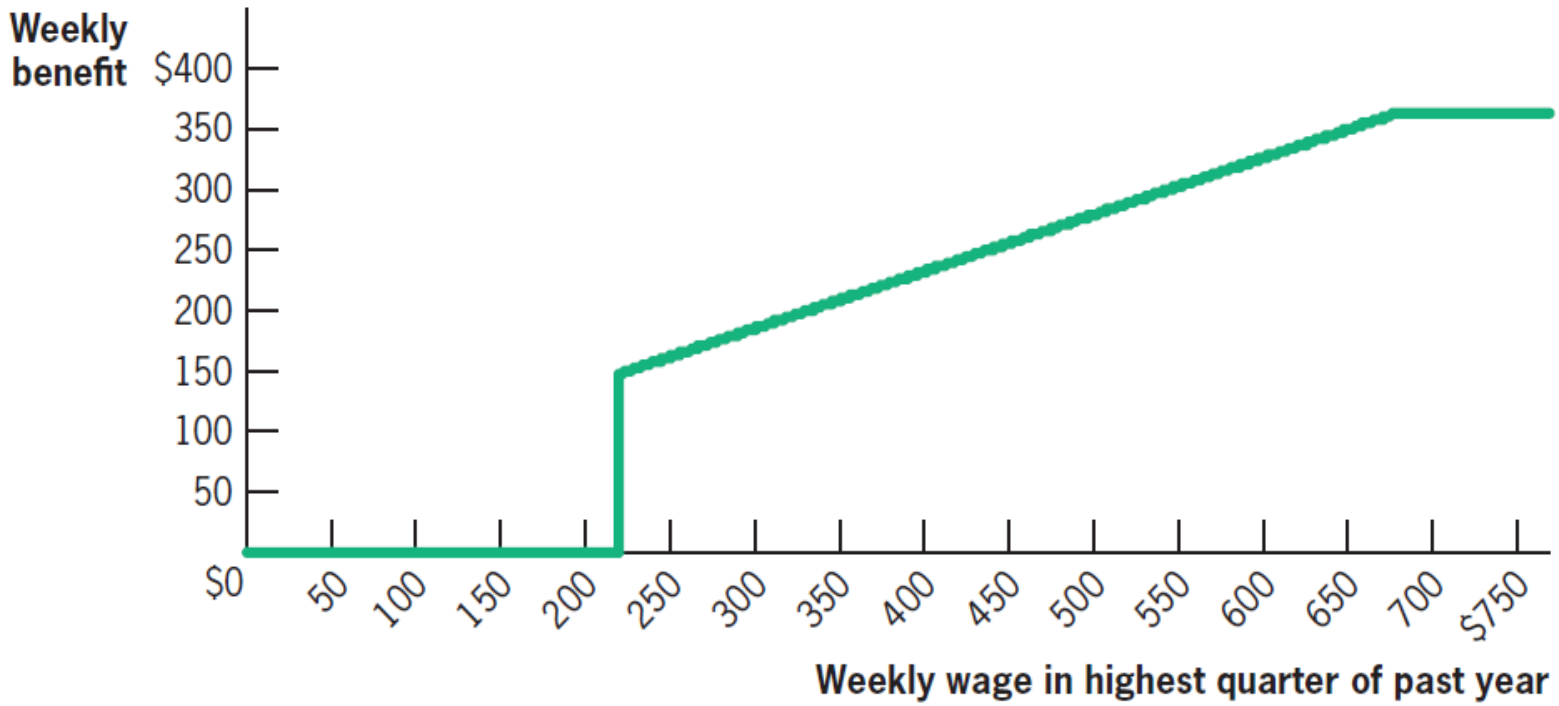
These benefits vary by state.

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

Unemployment Benefit Schedule for Michigan



UI Benefits Duration

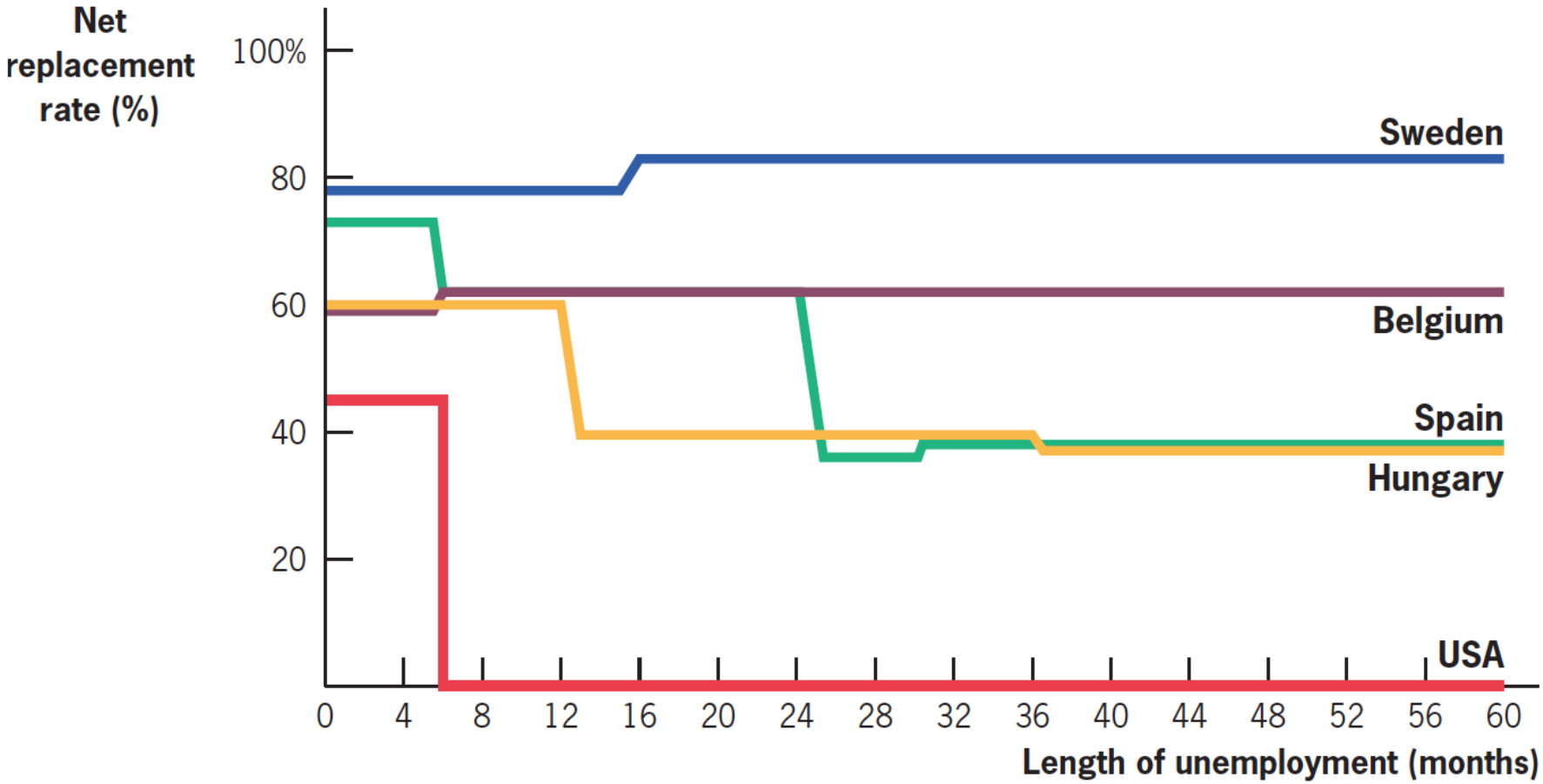
In general, one can collect UI for 6 months.

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

In deep recessions, benefits can be further extended (23 months in 2008-13)

Duration of UI benefits typically much higher in European countries

APPLICATION: The Duration of Social Insurance Benefits around the World



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 agent's 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

Individual's 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):

$$(1-p) \cdot t = p \cdot b \quad \Rightarrow \quad t = (p/(1-p)) \cdot b$$

Optimal UI with no moral hazard

No moral hazard means that p is not affected by UI

Plugging in govt. budget constraint, rewrite individual's expected utility as:

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

Government's 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

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

Take FOC wrt b (derivative of everything that depends on b):

$$\frac{dp}{db}\left(\underbrace{u(c_u) - u(c_e)}_{?} - (1-p)u'(c_e)\frac{1}{(1-p)^2}b\right) - (1-p)u'(c_e)\frac{p}{1-p} + pu'(c_u) = 0$$

Individual maximization: (individual doesn't care about govt BC! Takes t, w and b as given).

$$\max_p (1-p)u(c_e) + pu(c_u) \Rightarrow u(c_e) = u(c_u)$$

Optimal UI with moral hazard

$$-\frac{dp}{db}u'(c_e)\frac{1}{(1-p)}b + p(u'(c_u) - u'(c_e)) = 0$$

Multiply and divide by $\frac{b}{p}$ (trick) to make an elasticity appear.

$$-\frac{dp}{db}\frac{b}{p}\frac{p}{b}u'(c_e)\frac{1}{(1-p)}b + p(u'(c_u) - u'(c_e)) = 0$$

$$-\varepsilon_{p,b}u'(c_e)\frac{p}{(1-p)} + p(u'(c_u) - u'(c_e)) = 0$$

Divide everything by p.

$$-\varepsilon_{p,b}u'(c_e)\frac{1}{(1-p)} + (u'(c_u) - u'(c_e)) = 0$$

Rearrange:

$$\frac{u'(c_u) - u'(c_e)}{u'(c_e)} = \frac{1}{1-p}\varepsilon_{p,b}$$

Optimal UI with moral hazard

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 $u(.)$ but decreases with elasticity $\varepsilon_{p,b}$.

Empirical Estimation of Effects of UI

Moral hazard in UI manifests itself in the duration of the unemployment spell

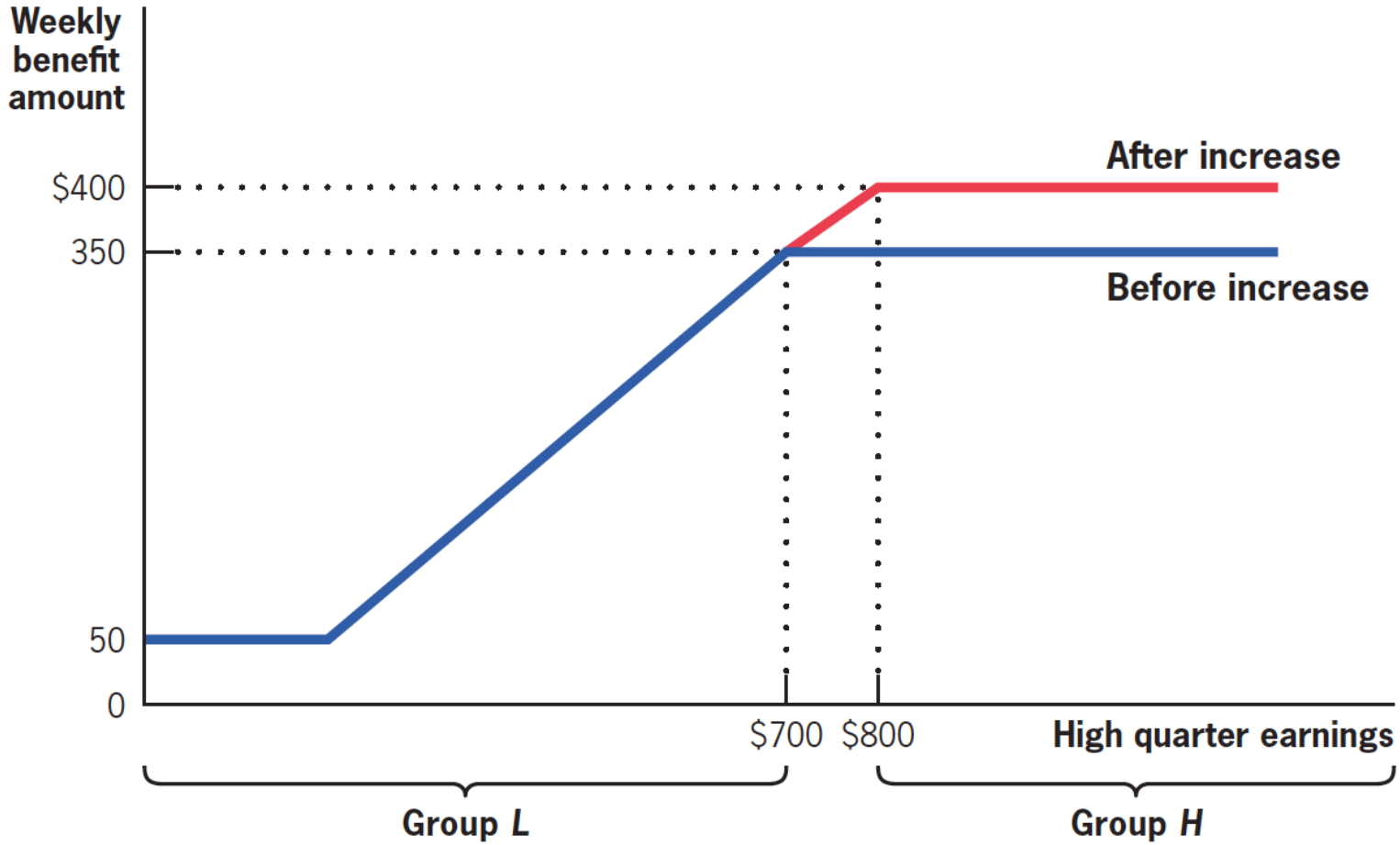
Economists ask whether the unemployed find jobs more slowly when benefits are higher

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

EVIDENCE: Moral Hazard Effects of Unemployment Insurance



Empirical Estimation of Effects of UI: Evidence

Meyer (1990) and many other 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

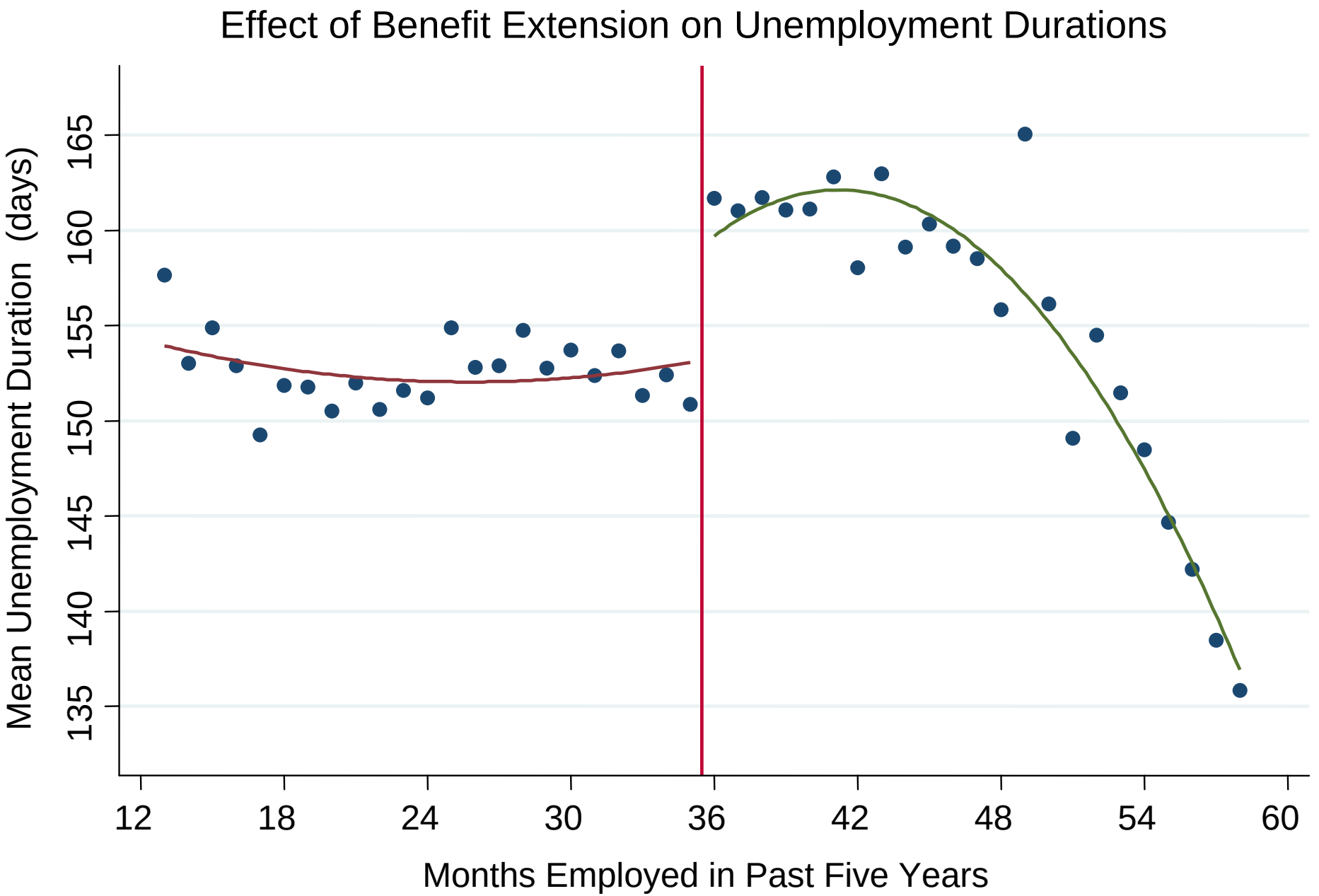
10% rise in unemployment benefits leads to about a 4-6% increase in unemployment durations.

More recent empirical approach: **regression discontinuity**

Card-Chetty-Weber (2007) use the fact that in Austria, you get up to 30 weeks of benefits when you have been employed for 36+ months in last 5 years (instead of up to 20 weeks)

Can look at duration of unemployment based on how long you have worked in last 5 years $\Rightarrow$ Finds somewhat smaller elasticity around 0.3

Card, Chetty, Weber (2007)



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. (this is called self-insurance)

Does UI have Long-Term Benefits?

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

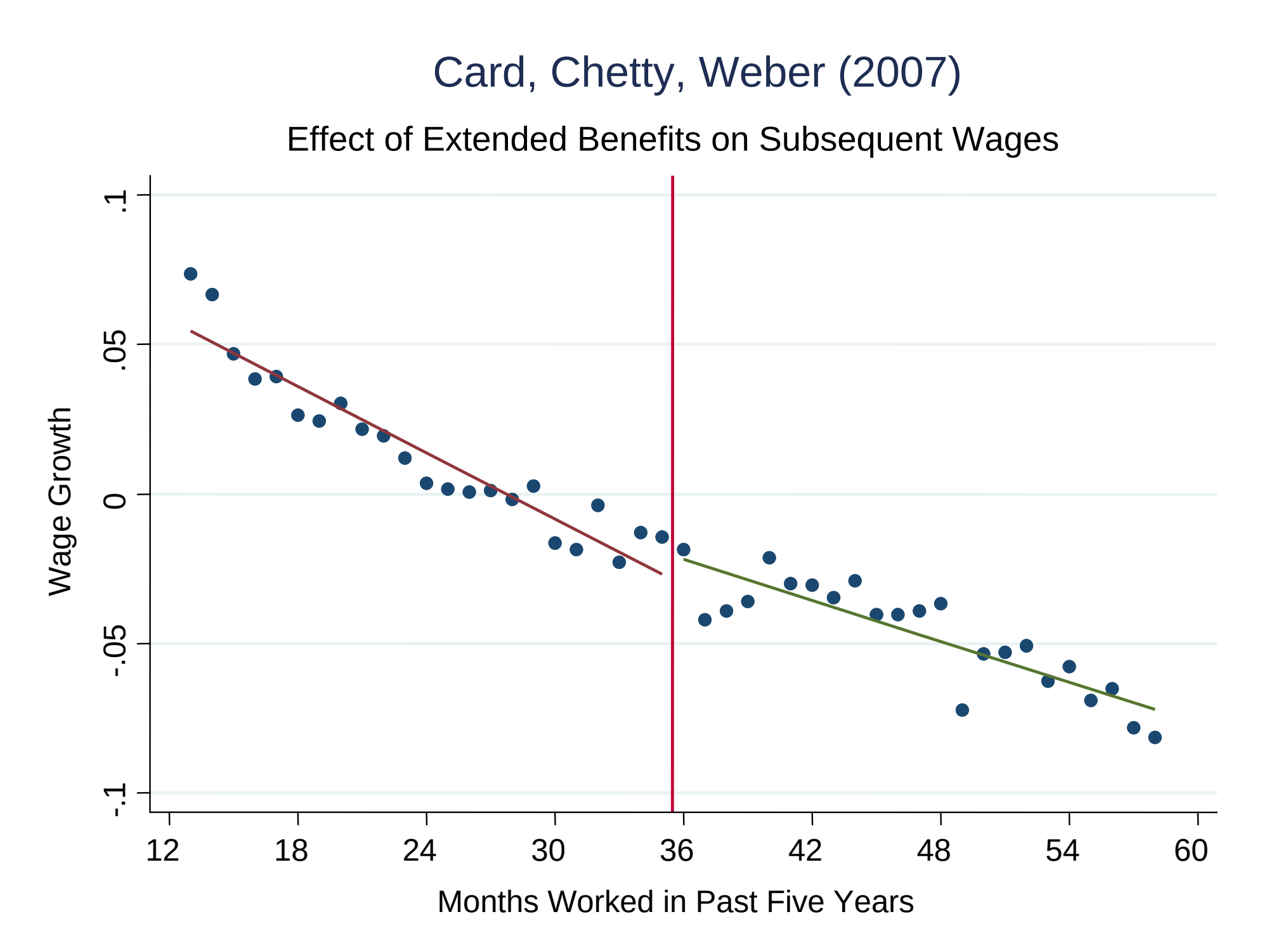
Are people forced to take worse jobs because they have to rush back to work to put food on the table?

E.g. engineer starts working at McDonalds.

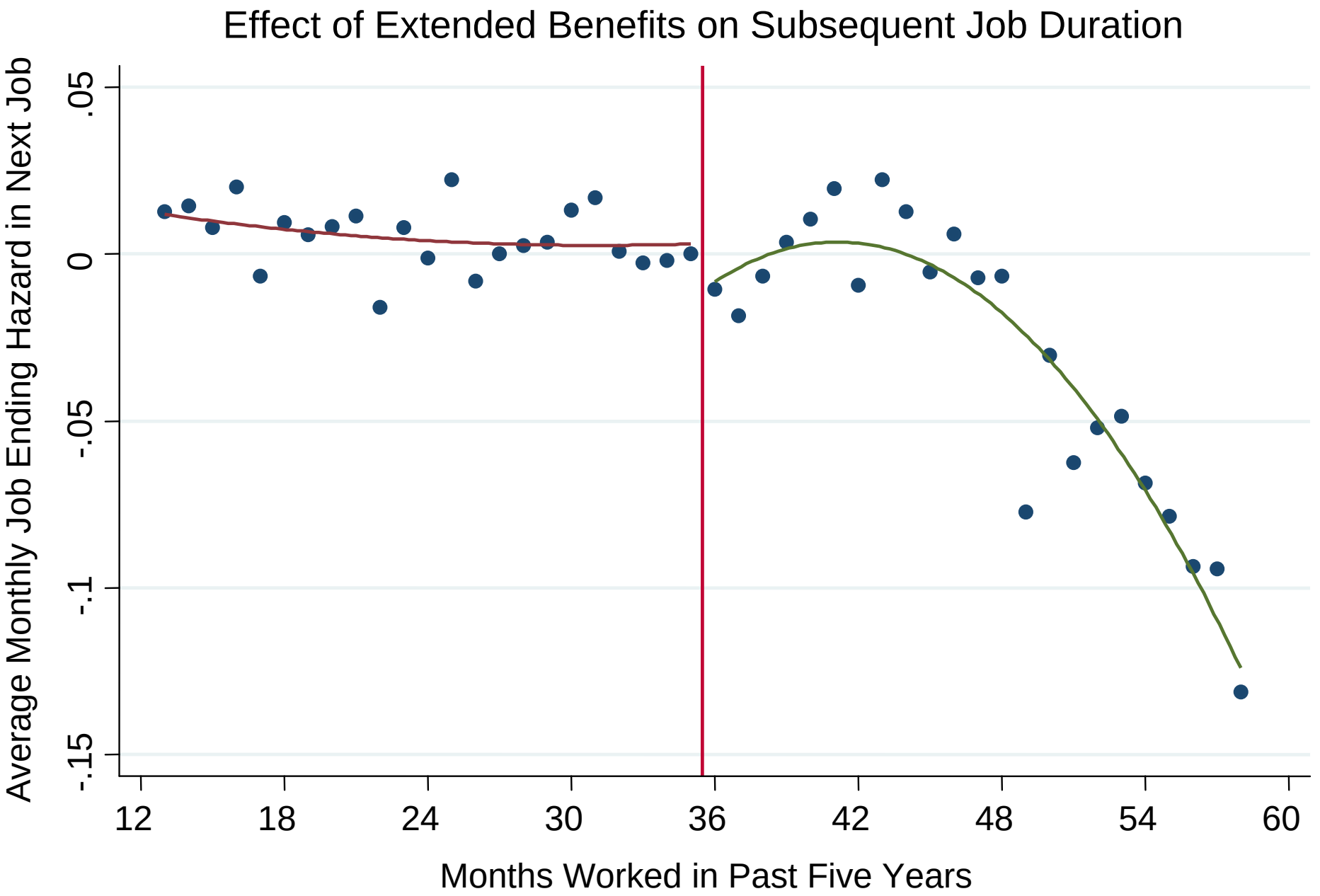
Can examine this using similar data

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
Wage Growth
.1
.05
0
-.05
-.1
12
18
24
30
36
42
48
54
60
Months Worked in Past Five Years

Card, Chetty, Weber (2007)



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

Should UI Benefits be Extended during Recessions?

US extends UI benefits during recessions. Extensions ended in 2014 (controversial policy debate)

1) Social Justice: Harder to find jobs in recessions $\Rightarrow$ being unemployed is less of a choice $\Rightarrow$ Extending benefits is desirable

2) Efficiency: In recessions, the job market is too slack [too hard to find jobs, too easy for firms to find workers].

a) If longer UI benefits decrease slack in labor market then longer UI benefits desirable [this is the case if UI benefits stimulate aggregate demand or if job seekers compete for a fixed number of jobs in recession, this is the left-wing view]

b) If longer UI benefits increase slack in labor market then shorter UI benefits desirable [this is the case if longer UI benefits increase the bargaining power of workers and hence increase wages further reducing labor demand, this is the right-wing view]

Economists try to tell apart a) from b) using empirical evidence

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) $\Rightarrow$ Scope for Moral Hazard

5) DI tends to be an absorbing state (very few go back to work)

US DISABILITY INSURANCE

1) In 2016, about 10.5m DI beneficiaries (not counting widows+children), about 5-6% of working age (20-64) population

2) Very rapid growth: In 1960, less than 1% of working age population was on DI

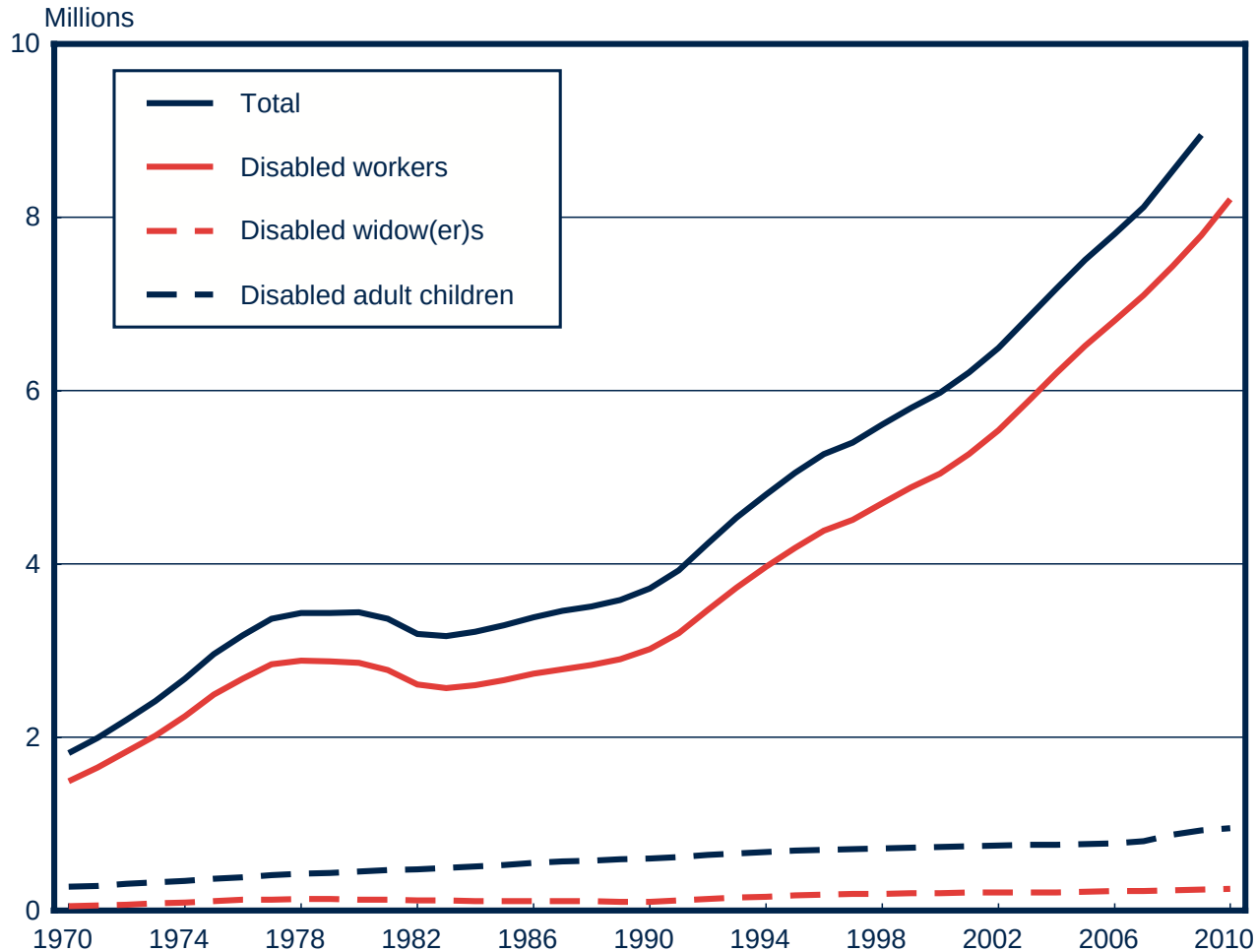
3) Growth particularly strong during recessions: early 90s, late 00s

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

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.

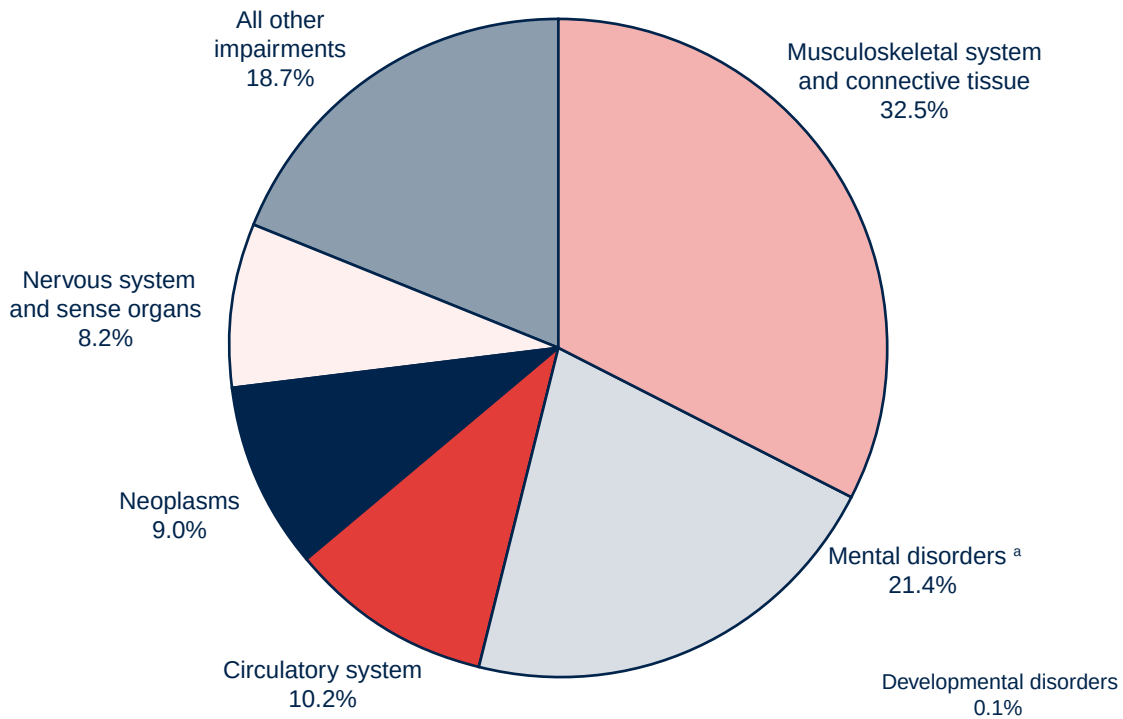


SOURCE: Table 3.

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

$\Rightarrow$ 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

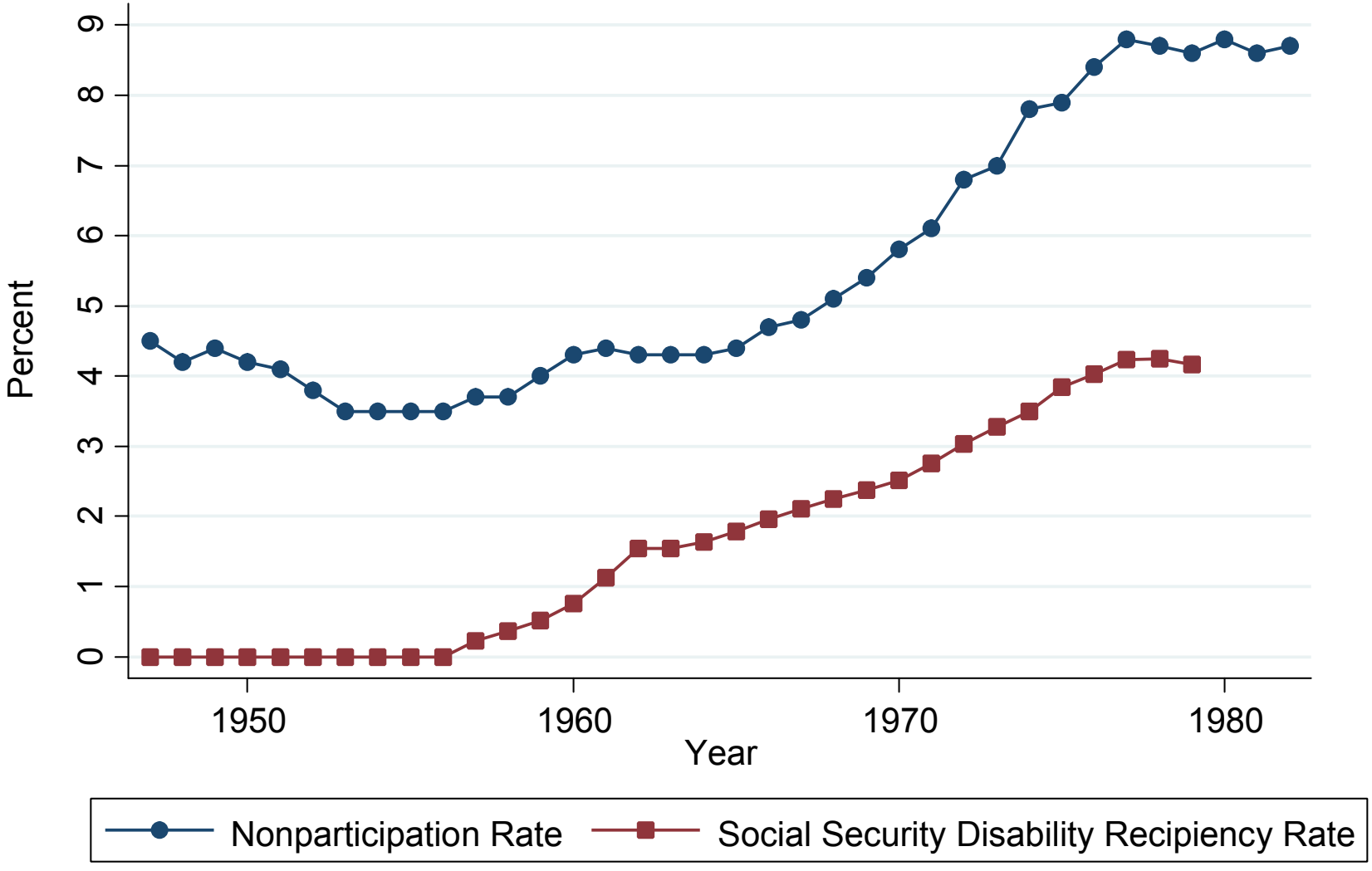
A. *Bureau of Disability Insurance Review One Year After Initial Determination (Percentages):*

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 Recipiency 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 fully for wages in regression because all variation in $DIreprate_i$ is due to wages

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 DI

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

Source: Bound 1991

DI EMPIRICAL EFFECTS: REJECTED APPLICANTS

Maestas-Mullen-Strand AER'13 obtain causal effect of DI on LFP using natural variation in DI examiners' stringency and large SSA admin data linking DI applicants and examiners

Idea: (a) Random assignment of DI appplicants to examiners and (b) examiners vary in the fraction of cases they reject $\Rightarrow$ Valid instrument of DI receipt

Result 1: DI benefits reduce LFP of applicants by 28 points $\Rightarrow$ DI has an impact but fairly small (consistent with Bound AER'89)

Result 2: DI has heterogeneous impact: small effect on those severely impaired but big effect on less severly impaired

Tough judges marginal cases unlikely to work without DI, lenient judges marginal cases somewhat likely to work without DI

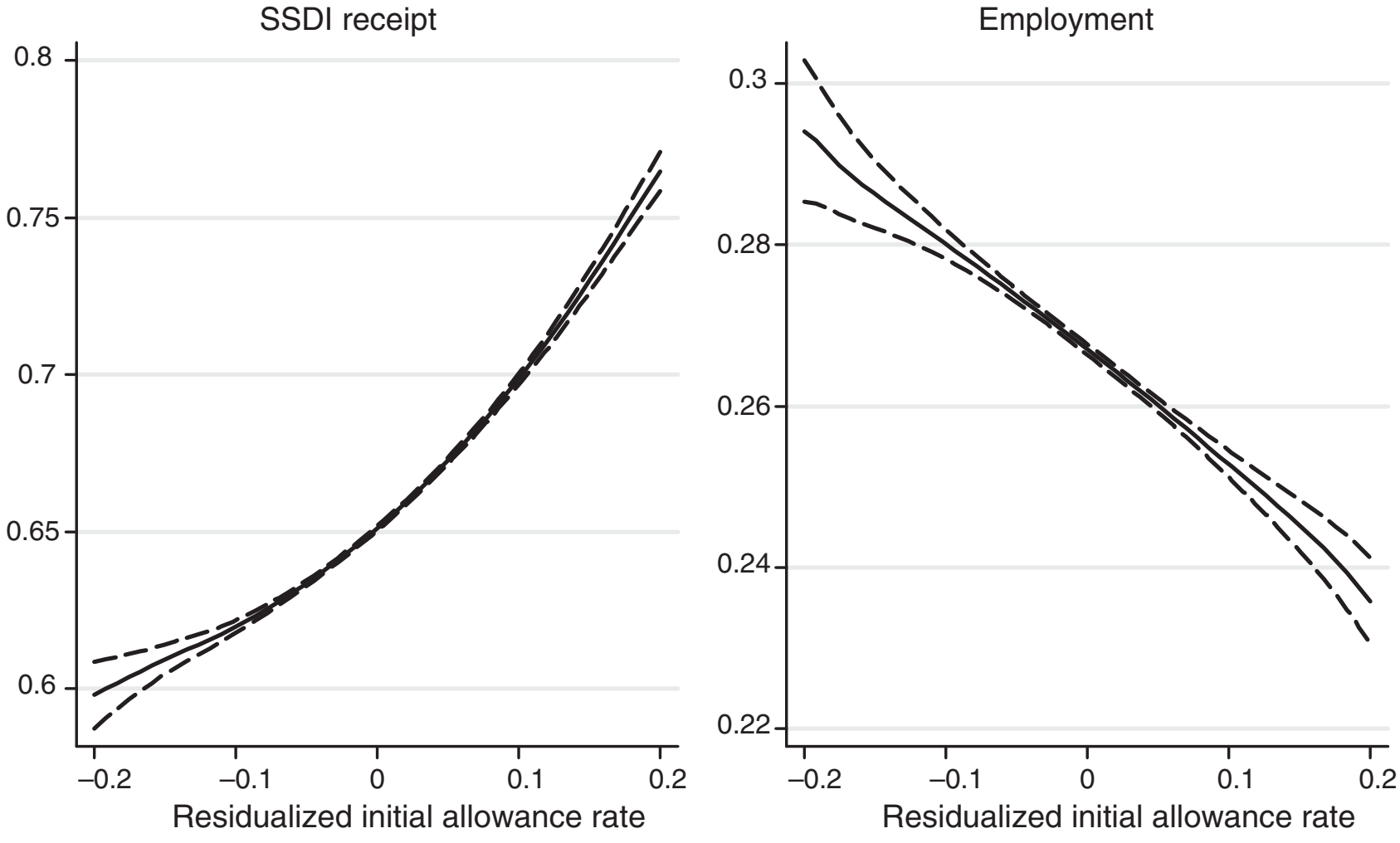


FIGURE 4. SSDI RECEIPT AND LABOR SUPPLY BY INITIAL ALLOWANCE RATE

Notes: Ninety-five percent confidence intervals shown with dashed lines. Employment measured in the second year after the initial decision. Bandwidth is 0.116 for DI and 0.130 for labor force participation.

Source: DIODS data for 2005 and 2006.

Workers Compensation: Institutional Features

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

Workers Compensation is a state-level program

Two components: medical and indemnity

Indemnity payment replaces roughly two-thirds of lost wages.

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

Substantial variation across states in benefit levels

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 paid high workers comp rates

Governor 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 week-end injuries into work injuries)

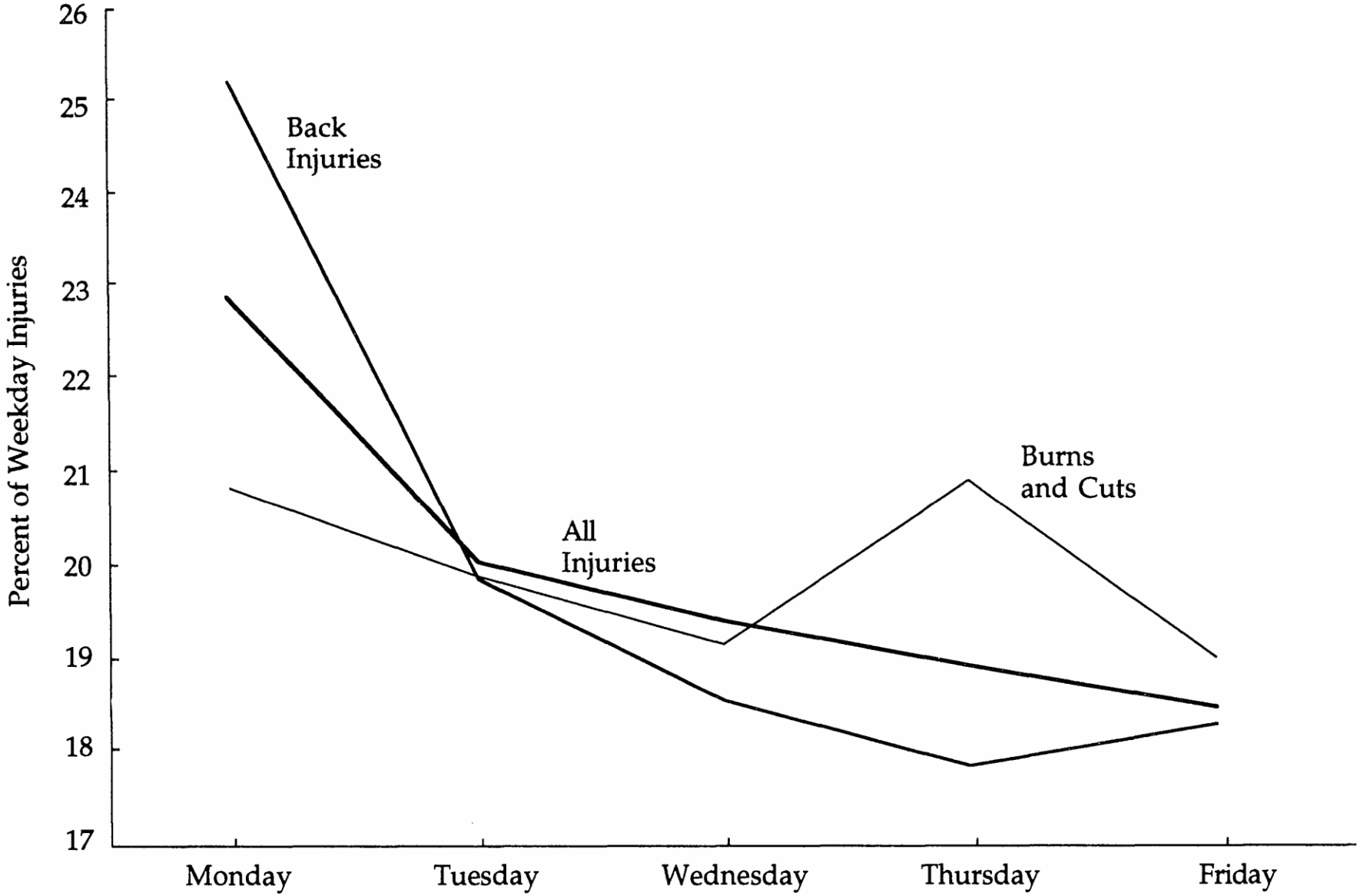


Figure 1. Distribution of Weekday Injuries.

Source: Card and McCall 1996

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	12.89	6.25	7.01	1.72	0.76	0.96
	(0.83)	(0.83)	(0.30)	(0.41)	(1.17)	(0.51)	(1.28)
Michigan	14.76	19.42	10.94	13.64	4.66	2.70	1.96
	(2.25)	(2.67)	(1.09)	(1.56)	(3.49)	(1.90)	(3.97)
Median duration (weeks)							
Kentucky	4.00	5.00	3.00	3.00	1.00	0.00	1.00
	(0.14)	(0.20)	(0.11)	(0.12)	(0.25)	(0.16)	(0.29)
Michigan	5.00	7.00	4.00	4.00	2.00	0.00	2.00
	(0.45)	(0.67)	(0.22)	(0.28)	(0.81)	(0.35)	(0.89)
Median medical cost (dollars)							
Kentucky	393.51	411.49	238.96	254.40	17.98	15.44	2.55
	(19.29)	(22.72)	(8.48)	(9.11)	(29.80)	(12.44)	(32.30)
Michigan	689.73	765.00	390.63	435.00	75.27	44.38	30.89
	(77.30)	(134.53)	(32.80)	(33.09)	(155.16)	(46.59)	(162.00)

Source: Meyer, Viscusi, Durbin 1995

Moral Hazard in Workers' Compensation

Result: 10% increase in WC benefit raises out-of-work duration due to 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 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

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