

Public Economics II: Public Expenditures

Lecture 6: Disability Insurance

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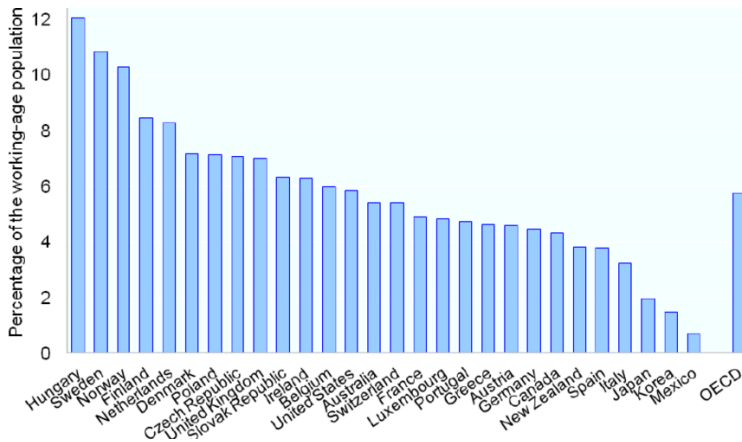
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- Disability is conceptually close to retirement: some people become unable to work until old age and "retire" early
- Most advanced countries offer public Disability Insurance (DI) that is usually linked to the public retirement system
- DI allows people to get retirement benefits before the ERA, if they are unable to work due to disability
- **Key question:** how to screen for individuals who are really disabled and need retire early?

- Onset of disability can occur at anytime from birth to retirement (and beyond).
 - Remember Mirrlees: *"...people should take out insurance at an age when they are incapable of doing so rationally, namely zero."*
- Information Issues:
 - It may not always be possible to observe who is disabled and who is not or how debilitating the disability is (e.g. back problems, mental health issues). → possible **moral hazard** is a concern.
- Disability and hence being on disability insurance can be an absorbing state:
 - This may make the moral hazard issue a bigger concern than it is with UI. UI generally has a cap or time limit, and so it ends. Those on disability may exit the labour market for good.

- Disability insurance is a large expenditure in most of the developed world

Percent of Working Age Population on Disability Benefits in the OECD



Disability Insurance importance

- Disability insurance is a large expenditure in most of the developed world
- Disability Insurance enrollment is on the rise...

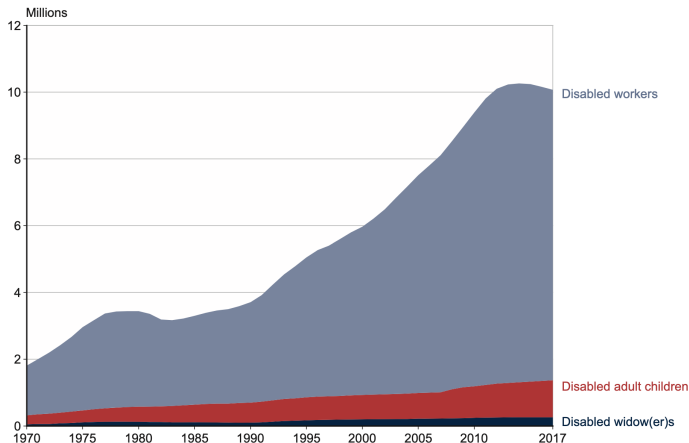
Rise of Disability in the US

Beneficiaries in Current-Payment Status

Chart 2.

All Social Security disabled beneficiaries in current-payment status, December 1970–2017

The number of disabled beneficiaries has risen from 1,812,786 in 1970 to 10,059,166 in 2017, driven predominately by an increase in the number of disabled workers. The number of disabled adult children has grown slightly, and the number of disabled widow(er)s has remained fairly level. In December 2017, there were 8,695,475 disabled workers; 1,105,405 disabled adult children; and 258,286 disabled widow(er)s receiving disability benefits.



Rise of Disability in the Norway

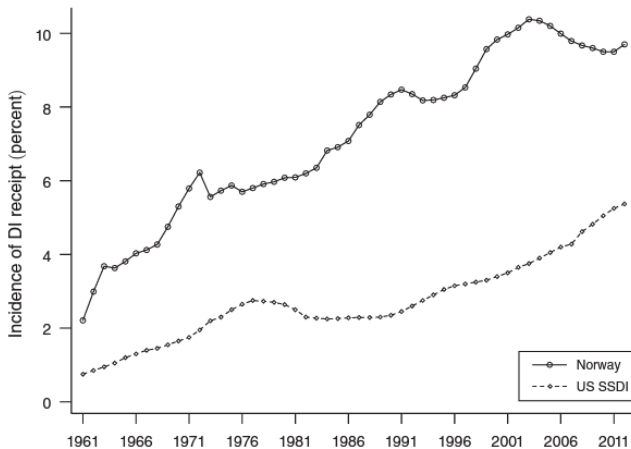
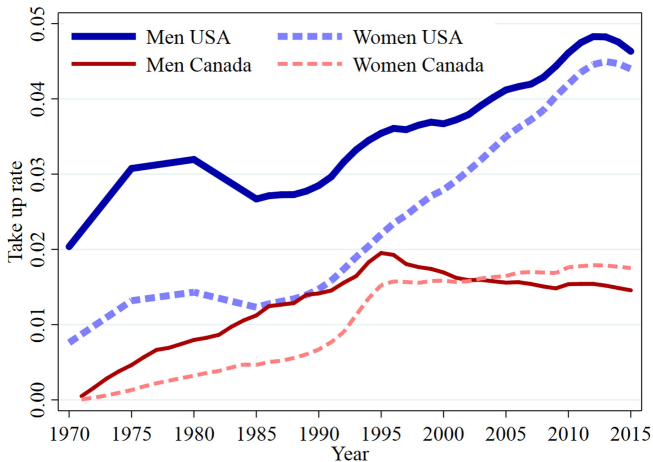


FIGURE 1. TRENDS IN DI RECEIPT IN NORWAY AND THE UNITED STATES

Disability Insurance importance

- Disability insurance is a large expenditure in most of the developed world
- Disability Insurance enrollment is on the rise... but not everywhere

Proportion of Workers Near Retirement Receiving Disability Pension in Finland in 1996 and 2004



Proportion of Workers Near Retirement Receiving Disability Pension in Finland in 1996 and 2004



- 1 Eligibility: Medical proof of being unable to work for at least a year, Need some prior work experience, (5 months in US) waiting period with no earnings required (screening device)
- 2 Social security examiners rule on applications. Appeal possible for rejected applicants. Imperfect process with big type I and II errors (Parsons, 1991) → Scope for Moral Hazard
- 3 DI tends to be an absorbing state (very few work again)

A Model of DI (Diamond and Sheshinski 1995)

Simplified version of the Diamond and Sheshinski DI model:

- Disability is modeled as having a high disutility of labour $\theta \sim F(\theta)$.
- When working utility is: $u(c_a) - \theta$
- Workers can apply for disability benefits:
 - After investigation (which reveals some info but not all) claim accepted with probability $p(\theta)$
 - If claim accepted individuals receive benefit c_d and have utility $u(c_d)$
 - If claim denied individuals can either choose to work or retire and get benefit c_r
 - Denied applicants will work if $u(c_a) - \theta \geq u(c_r)$

A Model of DI (Diamond and Sheshinski 1995)

For given policy bundle of $\{c_d, c_r, p(\theta)\}$ there will exist:

- $\theta_d = u(c_a) - u(c_d)$, above which individuals will apply for DI, but work if denied.
- $\theta_b = u(c_a) - u(c_b)$, above which individuals will apply for DI, and retire if denied.

Conceptually this is a difficult problem:

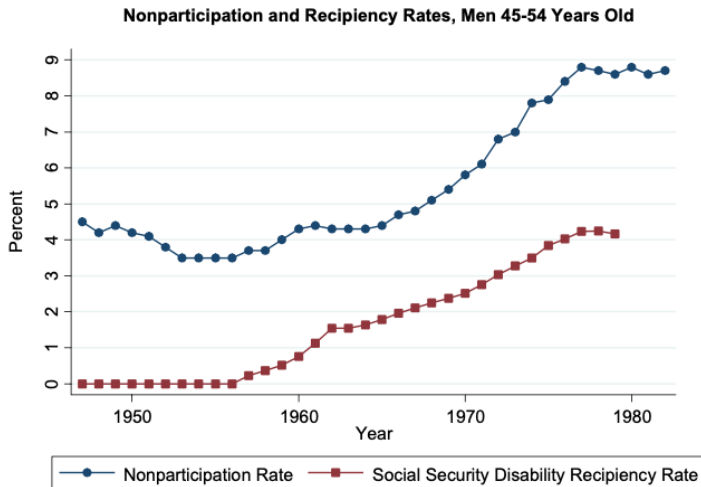
- Clearly if $u(c_a) - \theta < 0$ individuals should receive DI
- But if benefits offered: some with $u(c_a) - \theta > 0$ will apply for benefits.
- It is likely optimal for some of these people to have benefits.
- Can't set $p(\theta)$ too high though as would entice more with lower θ to apply.
- But you don't want those who actually need DI and who are denied to be destitute so must offer some level of c_r .
- But...

Key Empirical Questions Regarding DI

- ① Are DI beneficiaries unable to work? or...
- ② Are DI beneficiaries not working because of DI?
 - Normative consideration: Should DI recipients who can work be working? (think about θ here).

Literature begins with a debate between Parsons and Bound on the affect of DI and Labour Force Participation (LFP)

Percent of Population Receiving Disability Benefits in the OECD



Source: Parsons 1984 Table A1

The impact of DI on LFP? (Parsons 1980)

- Motivated by the parallel growth of DI recipients and non-participation rate Parsons attempts to explore the link between these two outcomes.
- Asks: Does the DI replacement rate (RR) have an impact on labour force participation (LFP)?

- ▶ $RR = \frac{\text{DI benefit}}{\text{Pre-disability income}}$

- Cross-section of men aged 45-59 in the NLSY.
- OLS:

$$LFP_i = \alpha + \beta RR_i + \epsilon_i$$

- Finds elasticity of 0.6
- Parsons:

"The recent increase in nonparticipation in the labor force of prime aged males can apparently be largely explained by the increased generosity of social welfare transfers, particularly Social Security disability payment"

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Issues with Cross-Sectional Evidence:

- Replacement rate depends on wages: $RR_i \uparrow$ when wage \downarrow . Likely that $E[RR_i \epsilon_i] \neq 0$ as likelihood of disability probably higher for those with lower wages.
- Parson's solution: control for wage. \rightarrow but variation in RR_i comes from variation in wages.
- Bound (1989) replicates Parson's regression on sample that never applied to DI and obtains similar effects implying that the OLS correlation not driven by DI

- **Idea:** If rejected applicants do not work, then surely DI recipients would not have worked absent DI → rejected applicants' LFP rate is an upper bound for LFP rate of DI recipients absent of DI
- **Results:** Only 1/3 of rejected applicants return to work
- **Conclusion:** The large trend of lower LFP cannot be fully explained by the growth in DI.

LFP of Rejected DI Applicants (Bound, 1989)

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
Median Weekly Earnings ^b	175	120	25	300	218	70

- Bound (1989) makes progress in creating a credible counterfactual for the LFP effects of DI.
- Looking at rejected applicants creates an upper bound of the potential LFP of DI applicants.
- Rejected and approved applicants are likely systematically different.
- Would be better to have some sort of random or quasi-random variation in application approval/rejection.
- How could this be done?

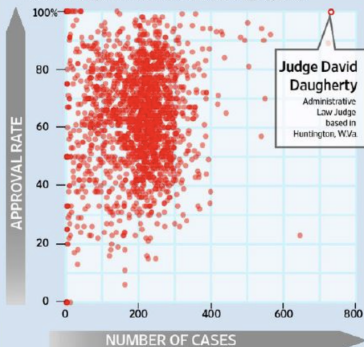
“Disability-Claim Judge Has Trouble Saying ‘No’. Near-Perfect Approval Record; Social-Security Program Strained



Judicial Outliers

Some Social Security judges award disability benefits to 90% or more of applicants

• The position of each dot represents the number of disability cases before each judge in each location, and the percentage approved.



Source: Social Security Administration

- Some DI judges/examiners are stricter than others.
- If cases are randomly assigned to judges we can use these differences in strictness as an IV for receipt of disability benefits.
- Looking at rejected applicants creates an upper bound of the potential LFP of DI applicants.
- Empirical design can be used to obtain causal estimates of the impact of receiving or being rejected from DI on labour supply.
- Can also be used to obtain casual estimates of the impact of DI on many other outcomes.
- Judge instruments are heavily used in the recent DI literature (close to as much as in the literature as crime)

A Short History of “Judge Fixed Effects”

Kling (2006) wants to measure the impact of prison sentence length (S) on employment/earnings (Y) with the model:

$$Y_i = S_i\gamma + \epsilon_i$$

To deal with endogeneity of S_i , Proposes the instrumenting for S_j using judge fixed effects Z_j :

$$S_j = Z_j\pi + Q_j\theta + \eta_j$$

Argues this is valid because cases are randomly assigned to judges conditional on the date and location of the case filing. Q_j are fixed effects included to control for the date and location of case filing.

A Short History of “Judge Fixed Effects”

Current judge IV practice:

- Suppose you want to estimate the impact of sending someone to prison (P) on recidivism (Y):

$$Y_{ict} = \beta_0 + \beta_1 P_{ict} + \beta_2 \mathbf{X}_{ict} + \varepsilon_{ict}$$

- Next suppose cases are randomized to judges conditional on courthouse and crime type. Regress the prison indicator variable on crime type by court house fixed effects and obtain the residualized prison probability

$$P_{ict}^* = P_{ict} - \gamma \mathbf{X}_{ct}$$

- Calculate the instrument as the leave-out mean of judges residualized prison probability in other cases:

$$Z_{icjt} = \left(\frac{1}{n_j - n_{ij}} \right) \left(\sum_{k=0}^{n_j} P_{ikt}^* - \sum_{c=0}^{n_{ij}} P_{ict}^* \right),$$

- ➊ Random assignment: the residualized judge propensity to incarcerate should not be correlated with offender characteristics.
- ➋ The IV is relevant: there is a strong relationship between the instrument and the probability of an offender being sent to prison.
- ➌ Exclusion restriction: the instrument only affects offender outcomes through the prison sentence.
- ➍ Monotonicity: Any individual who is incarcerated by a lenient judge would also be incarcerated by a strict judge (vice-versa)

- If assumptions 1-4 hold, then the judge IV estimates a Local Average Treatment Effect (LATE)
- Consider three groups of offenders in the sample
 - ① **Never Takers:** those who neither a lenient nor strict judge will send to prison
 - ② **Always Takers:** those who both a lenient or strict judge will always send to prison
 - ③ **Compliers:** those who a lenient judge wouldn't send to prison but a stricter judge would.
- The LATE in judge IV settings is the effect of prison (or the relevant treatment) on the compliers.
- We cannot say what the impact on the never takers and always takers is.
- The impact on the compliers is often very policy relevant.

Maestas-Mullen-Strand (2013) obtain causal effect of DI on LFP using natural variation in DI examiners' stringency and large SSA admin data linking DI applicants and examiners

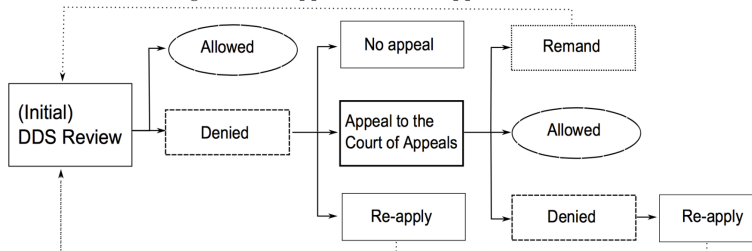
- Random assignment of DI applicants to examiners and (b) examiners vary in the fraction of cases they reject → Valid instrument of DI receipt
- DI benefits reduce LFP of applicants by 28 points → DI has an impact but fairly small (consistent with Bound (1989))

Results:

- Empirical design can be used to obtain causal estimates of the impact of receiving or being rejected from DI on labour supply.
- DI has heterogeneous impact: small effect on those severely impaired but big effect on less severely impaired

- Study impact of DI using administrative data in Norway
- Study impacts on:
 - Earnings
 - Income (benefit substitution)
 - Spousal labor supply
 - Consumption proxies
- Key lesson: spousal labor supply can help mitigate disability shock

Figure 1: DI Application and Appeals Process



Notes: This figure summarizes the description of the application and appeal process in the Norwegian DI system.

- Exploit random assignment of applicants to judges in the appeals process for DI
- Model:

$$A_i = \gamma Z_{ij} + X_i' \delta + \epsilon_{ij}$$

$$Y_{it} = \beta_t A_i + X_i' \theta_t + \eta_{it}$$

where

- A_i is an indicator for allowing DI after appeal
- Z_{ij} is the leniency measure of judge j to whom i is assigned
 - Based on previous case outcomes from the judge
- X_i is vector of controls
- Y_{it} is a dependent variable (e.g. consumption, earnings, spousal labor supply)

Figure 4: **Effect of Judge Leniency on DI Allowance**

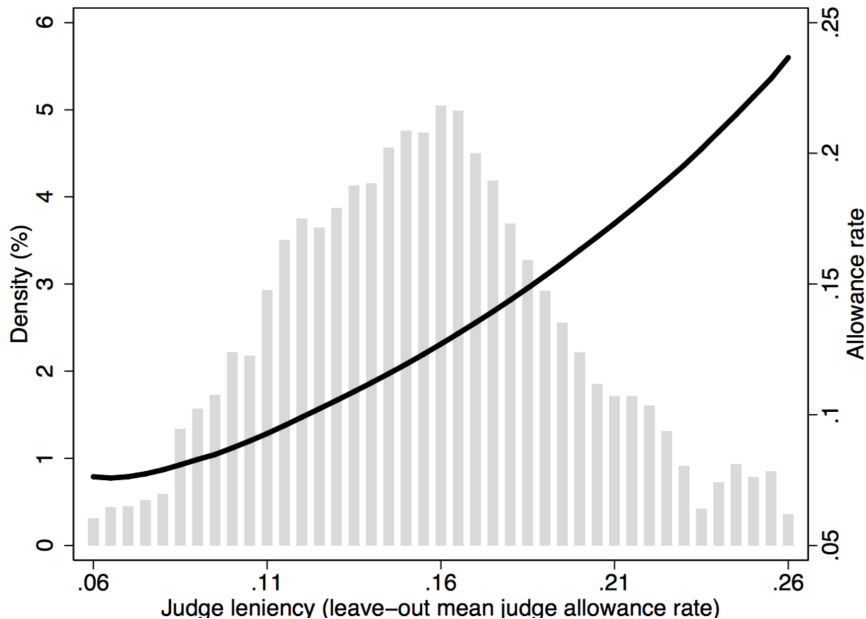
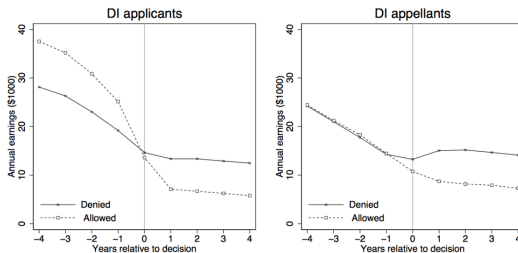


Figure 2: Earnings Trajectories of Allowed and Denied DI Applicants and Appellants



Notes: This figure displays mean real earnings for denied and allowed DI applicants (left-hand panel) and DI appellants (right-hand panel) in the nine years surrounding the initial DI determination (left-hand panel) and the initial outcome at appeal (right-hand panel). The applicant sample consists of all claims made during the period 1992-2003 by individuals who are at most 61 years of age. The appellant sample filed an appeal during the period 1994-2005 (see Section 3 for further details). Nominal values are deflated to 2005 and represented in US dollars using the average exchange rate NOK/\$ = 6.

TABLE 4—EFFECT OF DI ALLOWANCE ON LABOR EARNINGS, DI BENEFITS,
AND TRANSFER PAYMENTS OF THE APPELLANT

	Years after decision				Average
	1	2	3	4	
<i>Panel A. DI participation</i>					
Allowed DI	0.989 (0.071)	0.727 (0.102)	0.646 (0.098)	0.470 (0.084)	0.707 (0.078)
Dependent mean	0.305	0.432	0.519	0.577	0.456
<i>Panel B. DI benefits (\$1,000)</i>					
Allowed DI	16.240 (1.539)	12.596 (1.696)	10.203 (1.660)	8.167 (1.567)	11.883 (1.316)
Dependent mean	5.708	8.377	10.277	11.502	8.921
<i>Panel C. Earnings (\$1,000)</i>					
Allowed DI	-6.791 (2.765)	-5.946 (2.877)	-5.577 (2.952)	-5.660 (2.706)	-5.178 (2.275)
Dependent mean	14.240	14.282	13.802	13.245	13.813
<i>Panel D. Total transfers (\$1,000)</i>					
Allowed DI	10.188 (2.736)	8.807 (2.749)	8.148 (2.433)	6.429 (2.683)	8.072 (2.499)
Dependent mean	19.567	20.072	20.54	21.053	20.305
<i>Panel E. Non-DI transfers (\$1,000)</i>					
Allowed DI	-6.308 (3.273)	-3.744 (2.656)	-1.884 (2.062)	-1.611 (2.525)	-3.823 (2.298)
Dependent mean	14.009	11.839	10.398	9.666	11.521
Observations	13,972	13,842	13,709	13,607	13,972

TABLE 8—EFFECT OF DI ALLOWANCE ON SPOUSAL EARNINGS AND TRANSFER PAYMENTS

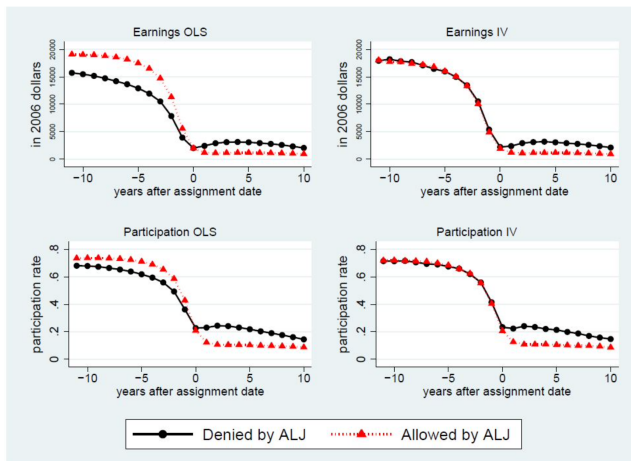
	Years after decision				
	1	2	3	4	Average
<i>Panel A. Married appellant's labor earnings (\$1,000)</i>					
Allowed DI	-5.042 (3.461)	-0.444 (4.068)	-4.426 (3.993)	-3.912 (3.625)	-3.566 (3.269)
Dependent mean	14.991	14.784	14.168	13.535	14.238
<i>Panel B. Married appellant's total transfers (\$1,000)</i>					
Allowed DI	9.110 (4.000)	6.499 (4.423)	5.008 (3.703)	5.395 (3.628)	5.948 (3.662)
Dependent mean	16.621	17.356	17.919	18.508	17.497
<i>Panel C. Spouses' labor earnings (\$1,000)</i>					
Allowed DI	-4.856 (8.102)	-17.009 (8.552)	-16.096 (7.828)	-16.794 (8.039)	-10.488 (7.345)
Dependent mean	40.965	39.565	38.777	37.487	39.025
<i>Panel D. Spouses' total transfers (\$1,000)</i>					
Allowed DI	-0.027 (3.334)	5.823 (3.683)	5.957 (4.152)	8.020 (4.614)	4.061 (3.609)
Dependent mean	11.196	11.938	12.622	13.349	12.4
Observations	7,844	7,740	7,648	7,548	7,844

Key Takeaways:

- In Norway, benefit substitution is significant (many transfers to low income)
- Despite this DI denial causes a significant drop in hh consumption and income for single appellants.
- Spousal labour earnings offset much of the reduction in earnings for married appellants
- Paper goes on to simulate welfare impacts of being granted DI:

Each net \$1 in public expenditure induced by a DI allowance raises the (money metric) welfare of single and unmarried awardees by nearly \$0.92 and of married households by \$0.58.

French and Song (2014): Find similar results in the US

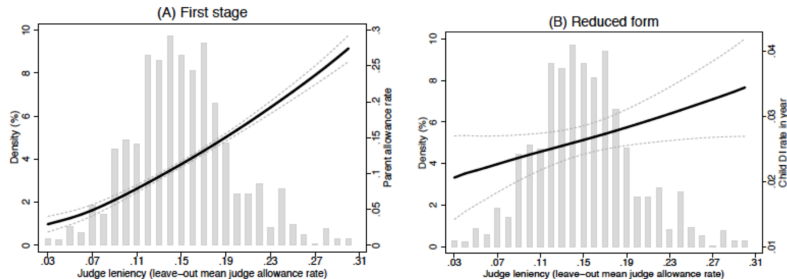


“Family Welfare Cultures” (Dahl, Kostol and Mogstad (2015))

- Large amount of evidence demonstrates strong intergenerational correlations between the use of welfare programs.
- Is this relationship causal?
 - Some say yes: parental welfare use creates a “welfare culture” that leads to children use of welfare programs
 - Some say no: determinants of poverty, poor health and disability are correlated across generations
- This paper uses judge leniency design to explore if a causal relationship exists, using the same research design and Norwegian context as Autor, Kostol and Mogstad (2015).
- Studies the impacts on those who were at least 18 years old when their parent applied for DI

“Family Welfare Cultures” (Dahl, Kostol and Mogstad (2015))

Figure 3: Effect of Judge Leniency on Parents (First Stage) and Children (Reduced Form).



“Family Welfare Cultures” (Dahl, Kostol and Mogstad (2015))

Table 3: Estimates of Intergenerational Welfare Transmission.

	<i>Child on DI 5 years after parent's appeal decision</i>			<i>Child ever on DI after parent's appeal decision</i>	
	First stage	Reduced form	IV	Reduced form	IV
A. No additional controls					
Parent's judge leniency	0.909*** (0.112)	0.055*** (0.020)		0.107*** (0.030)	
Parent allowed DI			0.061*** (0.022)		0.118*** (0.033)
B. With additional controls					
Parent's judge leniency	0.869*** (0.108)	0.052** (0.020)		0.101*** (0.027)	
Parent allowed DI			0.060*** (0.023)		0.116*** (0.032)
Dependent mean	0.12	0.03		0.08	

***p<.01, **p<.05, *p<.10. Standard errors (in parentheses) are clustered at the judge level.

“Family Welfare Cultures” (Dahl, Kostol and Mogstad (2015))

- Large impact of obtaining DI on children being on DI in the future
- What is the mechanism?
 - Welfare culture?
 - Reduced earnings?
 - Decision to apply?

Table 5: Effect of Parent’s DI Allowance on Child Labor and Educational Outcomes.

Dependent variable	<i>5 years after parent’s appeal decision</i>		
	Reduced form	IV	Dep. mean
A. DI	0.052** (0.020)	0.060*** (0.023)	0.03
B. Any employment	-0.119** (0.055)	-0.137** (0.065)	0.58
C. Full-time work	-0.065 (0.079)	-0.075 (0.090)	0.42
D. College degree	-0.079 (0.060)	-0.091 (0.069)	0.25

***p<.01, **p<.05, *p<.10. Standard errors (in parentheses) are clustered at the judge level.

- How does receipt of DI affect someones chance of dying?

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- **Common view:** Disability insurance should improve health and thus mortality:
 - Get disability income: lots of evidence suggests higher income \Rightarrow lower mortality

- How does receipt of DI affect someones chance of dying?
- **Common view:** Disability insurance should improve health and thus mortality:
 - Get disability income: lots of evidence suggests higher income \Rightarrow lower mortality
- **Alternative view:** Working is good for you:
 - Getting disability benefits discourages work \Rightarrow disability benefits could be harmful to health
- This paper: uses Judge IV design to estimate the impact of DI receipt on mortality

DI and Mortality (Black et al. 2017)

	<i>Panel A:</i> 5 Year Mortality (Percent)		<i>Panel B:</i> 10 Year Mortality (Percent)	
	OLS	IV	OLS	IV
<i>Without Covariates:</i>				
Allowed	8.13		20.60	
Denied	7.17		18.96	
Coef on allowance (Std. Error)	0.97 (0.10)		1.63 (0.18)	
Coef on demeaned allowance (Std. Error)	0.98 (0.11)	0.74 (0.40)	1.54 (0.18)	0.75 (0.73)
<i>With Covariates:</i>				
Coef on demeaned allowance (Std. Error)	1.46 (0.11)	1.09 (0.44)	2.38 (0.18)	1.44 (0.83)

- DI receipt slightly increases mortality
- Local average effect: mortality increases by roughly .7 p.p. after 5 years (baseline 8 p.p.)
- But: heterogeneity in effect based on judge leniency
 - Those assigned to least lenient judges and granted DI (i.e. more disabled) → mortality decreases.
 - DI helps if already have a high-cost high mortality condition
 - Otherwise, getting DI hurts

- Now, turn to a key question: How difficult should it be to get DI?
- If we increase the difficulty who is screened out?
- Explore 3 practices/reforms that make it more difficult (easy) to get DI
 - 1 Waiting periods
 - 2 Reducing services to help individuals apply
 - 3 Increasing medical review of recipients
 - 4 Age based leniency rules (i.e. less strict threshold for DI acceptance for older individuals)

- Lengthy application process → 5 months out of labour force required and with processing time it can take 10 months on average to get a decision.
- Extended periods outside of the labour force could hurt future job prospects → e.g. deterioration of skills or labour force attachment.
- May partially explain why those rejected from DI work so little...
- If waiting time also affects LFP of disability applicants at the margin then studies which solely focus on the accept/reject margin are underestimating the LFP effect of DI.

- Autor et al. use the following model to estimate the impact of DI application on LFP:

$$Y_i = \gamma D_i + \delta T_i + X_i \beta + \epsilon_i$$

- D_i is an indicator for receiving benefits and T_i is the applicants total processing time (months)
- This specification can measure 4 relevant effects of interest:
 - γ_i is the benefit receipt effect
 - δ_i labour supply decay rate given an extra month processing time
 - $\gamma + \delta T_i$ is the combined effect of DI application if accepted
 - δT_i is the combined effect when DI is rejected

Table 4: OLS, Reduced Form and Two-Stage Least Squares Estimates of Effect of Examiner Assignment on Labor Supply Outcomes of Initially Allowed Applicants

	Three Years Later (2008)			Six Years Later (2011)		
	100 × [Earn ≥ \$1K] (1)	100 × [Earn ≥ SGA] (2)	\$ Earnings (1,000s) (3)	100 × [Earn ≥ \$1K] (4)	100 × [Earn ≥ SGA] (5)	\$ Earnings (1,000s) (6)
<u>A. OLS</u>						
Final time	-0.202 ** (0.029)	-0.139 ** (0.018)	-0.061 ** (0.007)	-0.179 ** (0.029)	-0.114 ** (0.018)	-0.052 ** (0.008)
<u>B. Reduced Form</u>						
EXTIME	-0.233 * (0.103)	-0.113 ~ (0.069)	-0.075 * (0.033)	-0.198 * (0.100)	-0.118 ~ (0.068)	-0.054 (0.033)
<u>C. 2SLS</u>						
Final time	-0.391 * (0.172)	-0.190 ~ (0.115)	-0.126 * (0.054)	-0.332 * (0.168)	-0.199 ~ (0.114)	-0.091 (0.056)
Mean dep. variable	9.68	3.36	1.47	7.49	2.74	1.22

Notes: $N = 302,762$ in 2008 and $N = 277,024$ in 2011. Beneficiaries who die before the end of the calendar year are excluded. ** $p < 0.01$, * $p < 0.05$, ~ $p < 0.1$

Table 8: The Effect of SSDI Award on the Probability of Positive Annual Earnings ($> \$1K$) in Years Following Application: Impact of Accounting for Processing Time

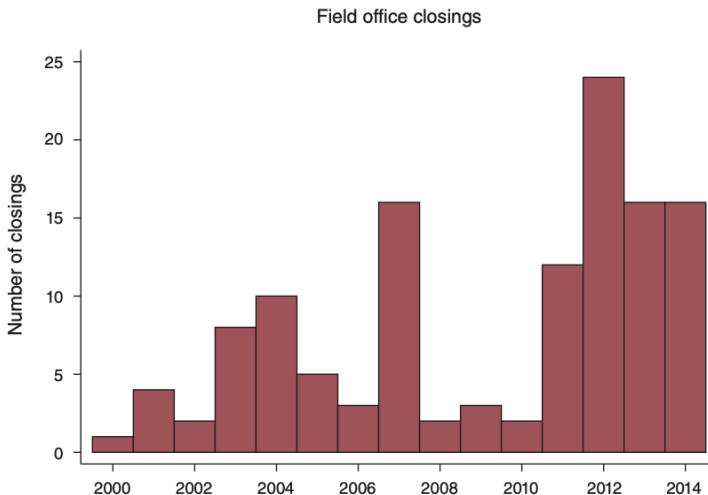
Dependent Variable: $100 \times [\text{Earn} \geq \$1K]$

	All Applicants (1)	Below-Median Earnings (2)	Above-Median Earnings (3)
	I. Three Years Later (2008)		
A. OLS	-31.3 ** (0.11)	-26.5 ** (0.14)	-40.8 ** (0.17)
B. 2SLS: Excluding Processing Time	-31.8 ** (3.81)	-34.6 ** (5.51)	-28.6 ** (5.44)
C. 2SLS: Including Processing Time	-45.6 ** (6.92)	-41.8 ** (9.73)	-50.6 ** (9.09)
D. Processing Time Bias in Labor Supply Estimate: Rows C - B	-13.9 * (5.80)	-7.2 (8.88)	-22.0 ** (9.12)
Mean Dep. Variable	22.4	24.6	20.1

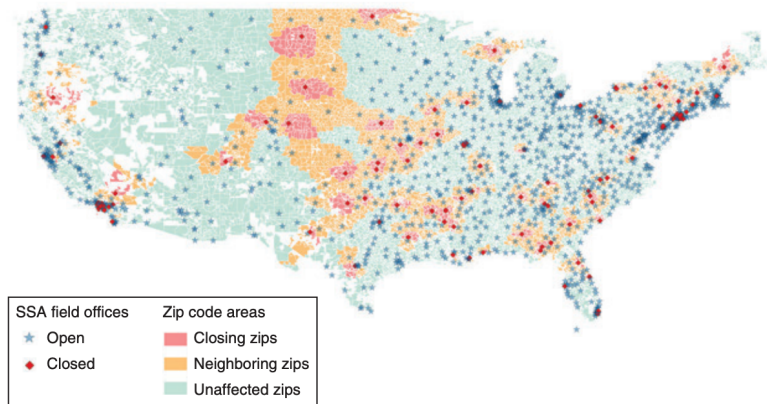
- How does raising the (implicit) cost of DI impact DI application and take-up?
 - Nichols and Zeckhauser (1982): application costs may screen out high-ability individuals with high opportunity cost of time.
 - Behavioural economics: increased hassle of application may discourage those most in need (Bertrand, Mullainathan and Shafir (2004))
- This paper: explores the impact of increased application costs caused by the closing of DI field offices which provide assistance with filing DI applications.

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Who is Screened Out (Deshpande and Li 2018)



Who is Screened Out (Deshpande and Li (2018))

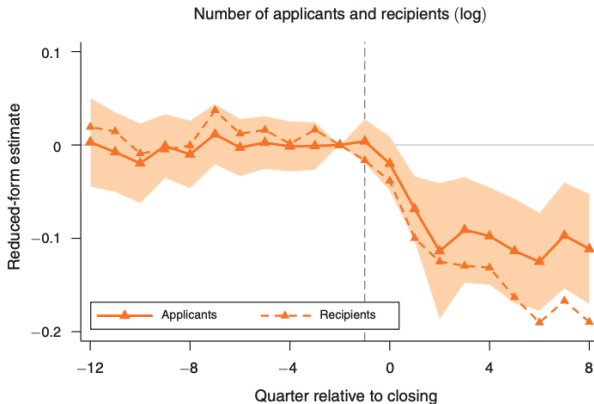


- Event Study Design:

$$Y_{isct} = \alpha_i + \gamma_{st} + \delta_0 \textit{Treated}_{ic} + \sum_{\tau} D_{ct}^{\tau} + \sum_{\tau} \delta_{\tau} (\textit{Treated}_{ic} \times D_{ct}^{\tau}) + \epsilon_{isct}$$

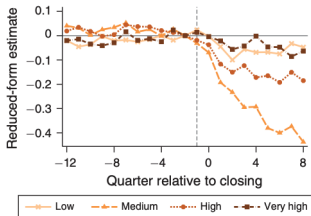
- Treatment group: ZIP codes with closures
- Control group: ZIP codes with closures in future years

Who is Screened Out (Deshpande and Li 2018)

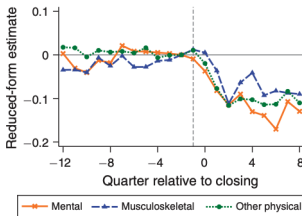


Who is Screened Out (Deshpande and Li 2018)

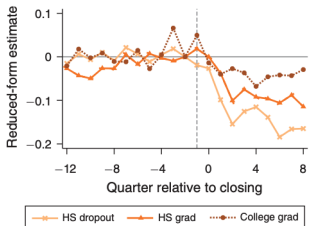
Panel A. Number of applicants by severity (log)



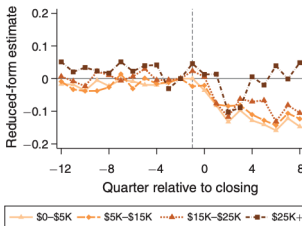
Panel B. Number of applicants by disability type (log)



Panel C. Number of applicants by education (log)



Panel D. Number of applicants by pre-application earnings



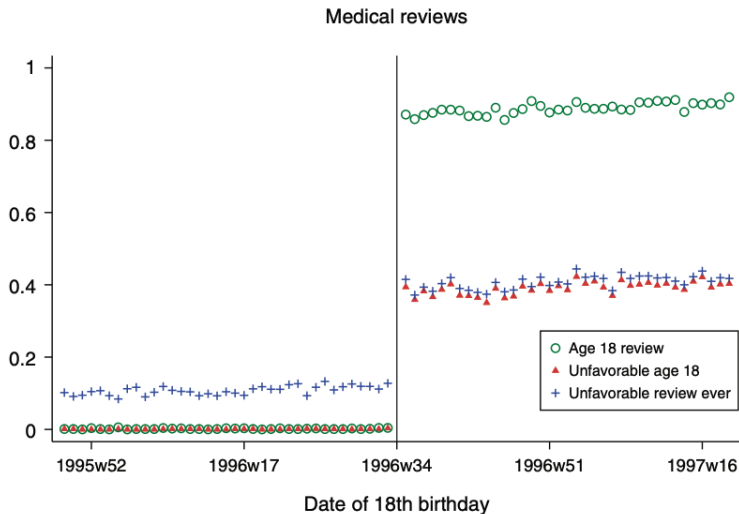
Who is Screened Out (Deshpande and Li 2018)

- Field office closings reduce the number of DI applications by 10%
 - Number of DI recipients falls by 16%
 - Therefore closings disproportionately discourage applications from those who would have been accepted if they had applied
- ⇒ targeting efficiency made worse by the increase in application costs.
- Closings have the largest discouragement effects for those with moderately severe conditions, low education levels, and low pre-application earnings.

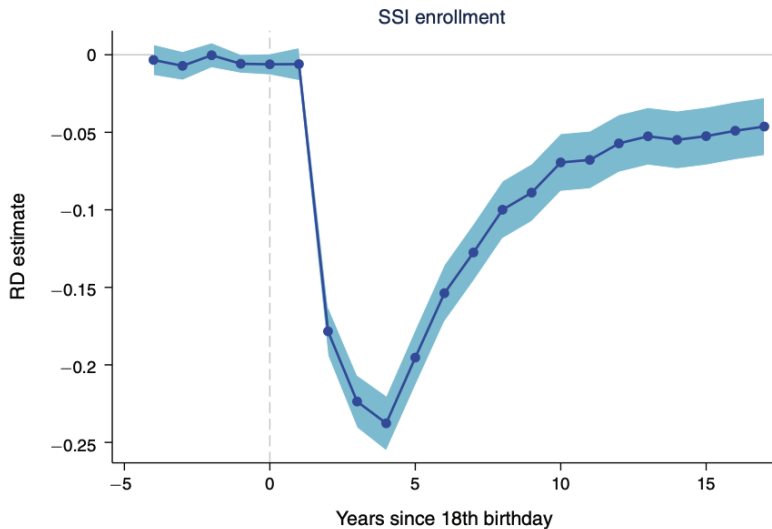
Does Welfare Inhibit Success? (Deshpande 2016)

- Does DI for young people inhibit labour market success and self-sufficiency?
- Exploits welfare reform law in the US that initiated a large increase in medical review for youth on DI
- The law applied only to children with an 18th birthday after August 22, 1996 → fuzzy regression discontinuity (RD) design

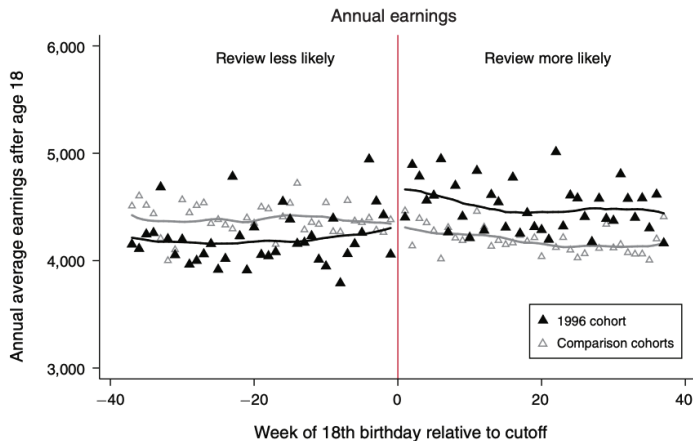
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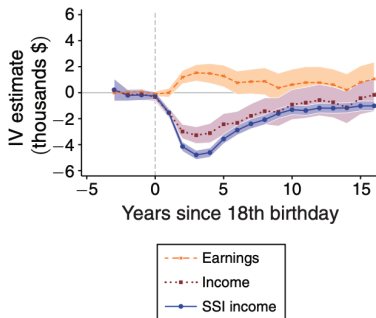


Does Welfare Inhibit Success? (Deshpande 2016)

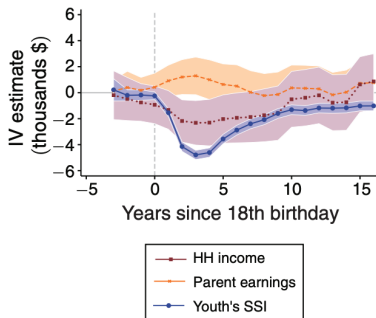


Does Welfare Inhibit Success? (Deshpande 2016)

Panel A. Own earnings and income

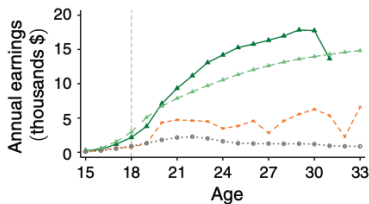


Panel B. Household earnings and income

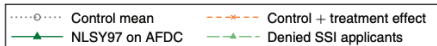
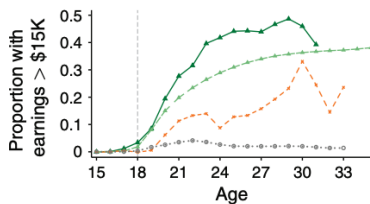


Does Welfare Inhibit Success? (Deshpande 2016)

Panel A. Annual earnings



Panel B. Earnings > \$15K



Does Welfare Inhibit Success? (Deshpande 2016)

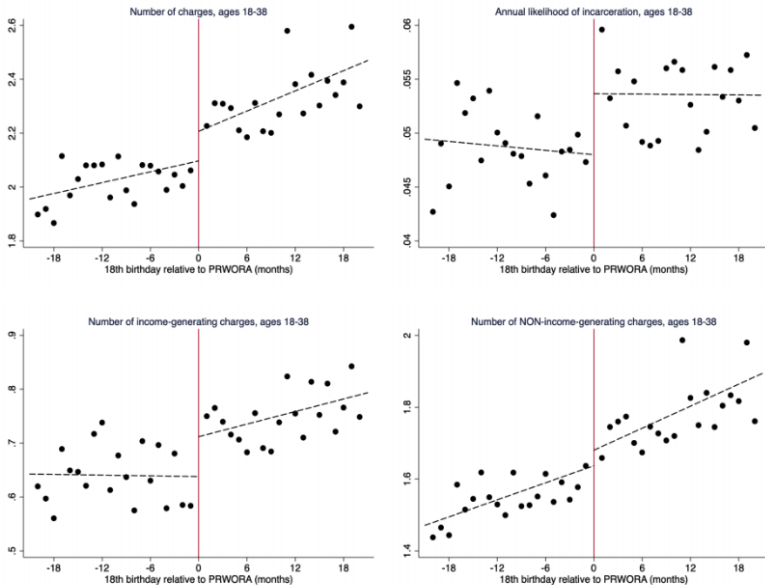
- Results: DI lowers earnings for youth
- But the earnings response is minimal for those who are removed from the program
 - Lost DI income is far from recovered
- Suggests those enrolled in DI on the margin do not have strong outside work options
- Question: could DI enrollment have caused the weak outside option?
 - What if un-enrolled earlier? Or, what if they knew they'd lose DI at age 18, would they work harder in school?

Does Welfare Prevent Crime? (Deshpande and Mueller-Smith 2022)

- Studies the impact of the same reform on criminal justice outcomes for youth removed from DI.

Does Welfare Prevent Crime? (Deshpande and Mueller-Smith 2022)

Figure III: Reduced form: Criminal justice outcomes across cutoff



Does Welfare Prevent Crime? (Deshpande and Mueller-Smith 2022)

Table I: RD and IV estimates of effects on criminal justice outcomes

	Extensive			Intensive		
	RD Pt Est (SE)	IV Pt Est (SE)	Mean	RD Pt Est (SE)	IV Pt Est (SE)	Mean
First stage (N = 28,843)						
Age 18 medical review	0.853*** (0.005)		0.002			
Unfavorable review	0.36*** (0.007)		0.0004			
On SSI from ages 19-22	-0.152*** (0.007)		0.822			
All crime						
Any charge (N = 21,768)	0.023** (0.012)	0.062** (0.032)	0.387	0.171* (0.092)	0.464* (0.249)	2.041
Incarcerated (annual likelihood/days) (N = 26,991)	0.011*** (0.004)	0.029*** (0.010)	0.047	3.222*** (1.133)	8.791*** (3.092)	13.39
Ever incarcerated (N = 26,991)	0.016** (0.008)	0.043** (0.021)	0.133			
Incarceration/parole/probation (ann likelihood/days) (N = 22,705)	0.011 (0.010)	0.029 (0.027)	0.229	4.671** (2.328)	12.72** (6.331)	36.03
Charges related to income-generating activity (N = 21,768)						
Total	0.034*** (0.011)	0.063*** (0.03)	0.240	0.140*** (0.039)	0.380*** (0.105)	0.625
Burglary	0.005 (0.007)	0.014 (0.018)	0.068	0.023 (0.015)	0.063 (0.041)	0.129
Theft	0.029*** (0.009)	0.080*** (0.023)	0.121	0.088*** (0.024)	0.240*** (0.064)	0.258
Fraud/forgery	0.007 (0.007)	0.018 (0.020)	0.076	0.006 (0.016)	0.016 (0.044)	0.135
Robbery	0.008* (0.005)	0.021* (0.012)	0.030	0.006 (0.008)	0.017 (0.021)	0.046
Drug distribution	0.005 (0.007)	0.013 (0.019)	0.071	0.019 (0.015)	0.050 (0.041)	0.125
Prostitution	0.005*** (0.002)	0.012*** (0.005)	0.004	0.014*** (0.005)	0.039*** (0.014)	0.010
Charges unrelated to income-generating activity (N = 21,768)						
Total	0.005 (0.012)	0.014 (0.031)	0.357	0.036 (0.076)	0.098 (0.205)	1.585
Non-robbery violent	0.013 (0.010)	0.036 (0.027)	0.182	0.031 (0.026)	0.083 (0.072)	0.377
Disorderly conduct/obstruction/resisting arrest	0.016* (0.009)	0.043* (0.024)	0.128	0.049** (0.023)	0.132** (0.063)	0.260
Criminal trespass	0.004 (0.005)	0.010 (0.015)	0.045	0.027** (0.012)	0.073** (0.033)	0.062
Drug possession or paraphernalia	0.014	0.039	0.136	0.034	0.092	0.303

Does Welfare Prevent Crime? (Deshpande and Mueller-Smith 2022)

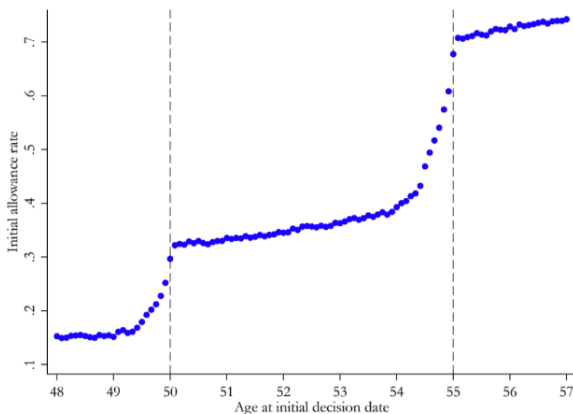
- Appears that those removed from DI due to review at age 18 are supplementing lost income by committing crime.
- In fact more opt into crime than into legitimate employment!

Employment (N = 28,843)					
Annual employment (earnings > \$ 5K/yr)	0.028*** (0.007)	0.077*** (0.018)	0.216		
Annual employment (earnings > \$ 15K/yr)	0.016*** (0.005)	0.044*** (0.014)	0.113		
Annual earnings				511.8*** (192)	1,421*** (528.6) \$4,676

Disability and Financial Distress? (Deshpande, Gross and Su 2019)

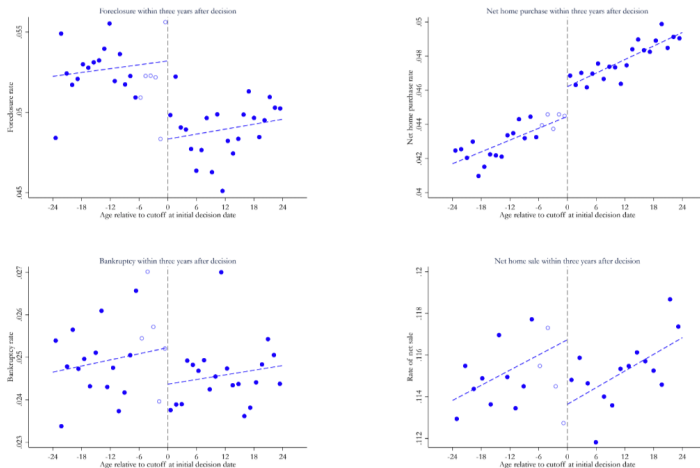
- Explores the impact of being granted DI on the likelihood of experiencing adverse financial event including: bankruptcy, foreclosure and home sale.
- Uses rule that makes rules for acceptance more lenient for applicants who are 55 or older → RD design
- But, there is a borderline rule which allows examiners to apply more lenient rules to those who are close to 55 on a discretionary basis → donut RD

Figure 4: Initial Allowance Rate at Step 5 By Age



Disability and Financial Distress? (Deshpande, Gross and Su 2019)

Figure 8: Bankruptcy, Foreclosure, Net Home-Sale, and Net Home-Purchase Rates Relative to Applicant Age



- My opinion: Donut RD = iffy...
- But: The reduced form evidence is convincing that being granted DI leads to a reduction in adverse financial events.

- Disability insurance expenditures are large and growing
- Evidence exists that moral hazard is a concern: lower LFP, intergenerational impacts, mortality effects...
- But DI also helps: lower crime, mortality down for the most disabled, reduction in adverse financial shocks...
- Loosen restrictions: helps disabled more moral hazard
- Tighten restrictions: less moral hazard, harm to actually disabled
- Low & Pistaferri (2015) estimate model that suggests it is optimal to make DI more generous...