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RESEARCH

**Does Disability Insurance Receipt Discourage Work?
Using Examiner Assignment to Estimate Causal Effects of SSDI Receipt**

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13th Annual Joint Conference of the RRC

August 4-5, 2011

MRRC (SSA) funding gratefully acknowledged (UM10-04, UM11-01)

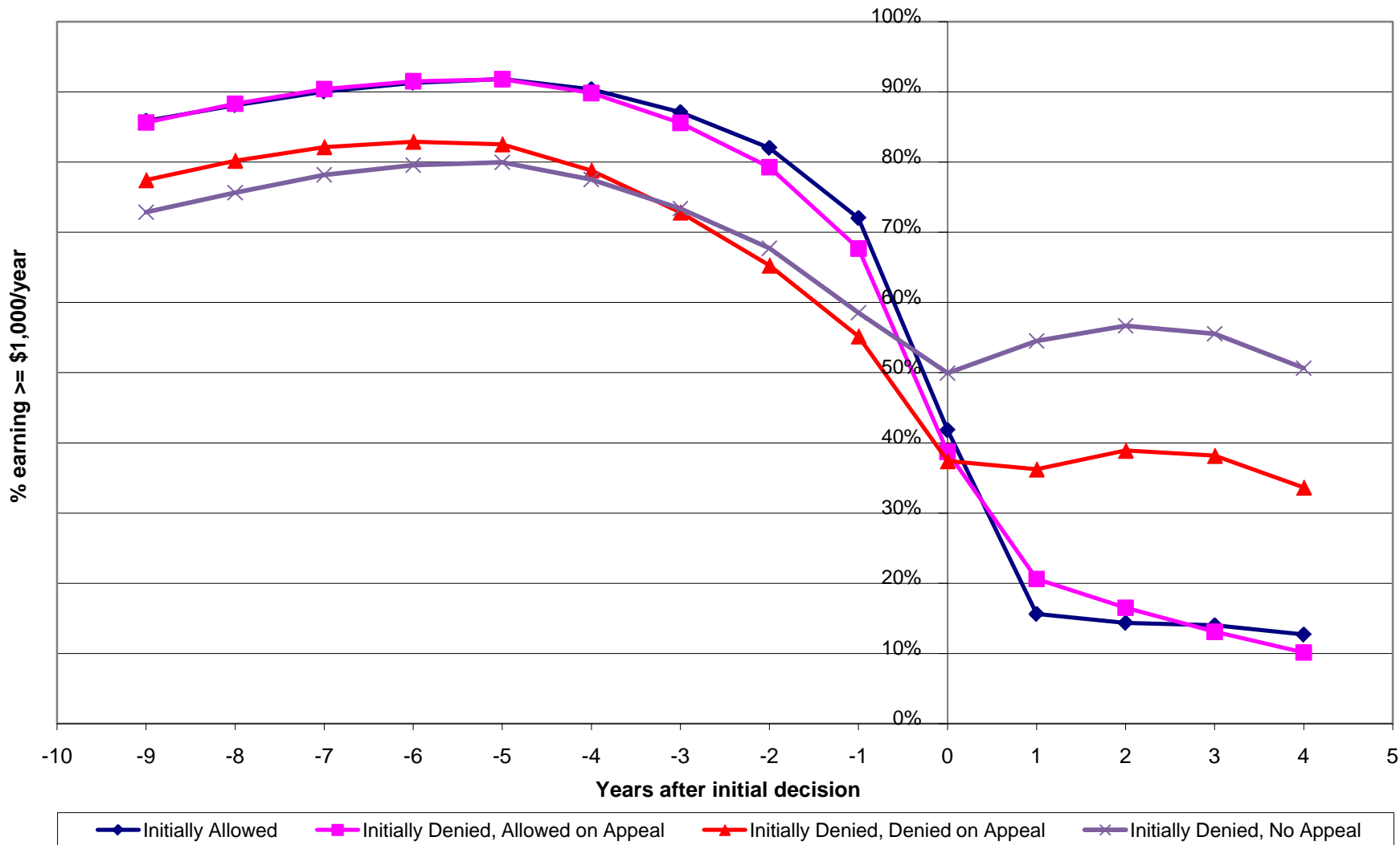
SSDI Growth Has Sharpened Focus on Constraining Costs

New evidence on key policy questions

- Do SSDI recipients have work capacity?
- Who is the marginal SSDI entrant?
- Do long application processing times erode human capital?
- Does the program process cases consistently and efficiently?

Labor Force Participation of SSDI Applicants

2005 Decisions



Empirical Strategy

- Based on idea that there is an examiner-specific component to allowance thresholds
 - All else equal, cases sent to lower-threshold examiners more likely allowed
- Cases randomly assigned to DDS examiners
 - Creates “as-good-as random” variation in SSDI receipt
 - Instrument for individual’s ultimate award decision with their DDS examiner’s allowance propensity
- First **causal** estimate of work disincentive effect based on **entire population** of SSDI applicants

Data

- Disability Operational Data Store (DIODS)
 - Universe of SSDI applications, 2005-2006
 - Workload management database
 - Contains alphanumeric examiner codes
- Master Beneficiary Record (MBR)
 - Link to determine ultimate outcome
- Detailed Earnings Record (DER)
 - Uncapped earnings (Medicare box on W-2)

Summary Statistics

- 2,380,255 disabled worker applications
- 7,193 DDS examiners with 10+ cases
- 37% for musculoskeletal impairments, 22% for mental disorders
- Mean age at application = 47 years
- Mean earnings 3-5 years prior = \$22K/year

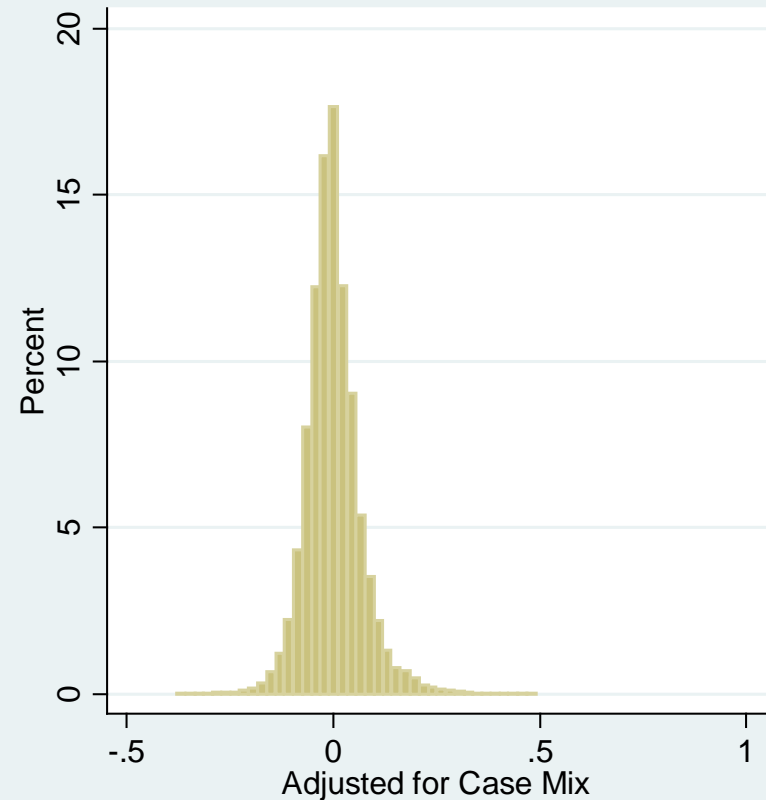
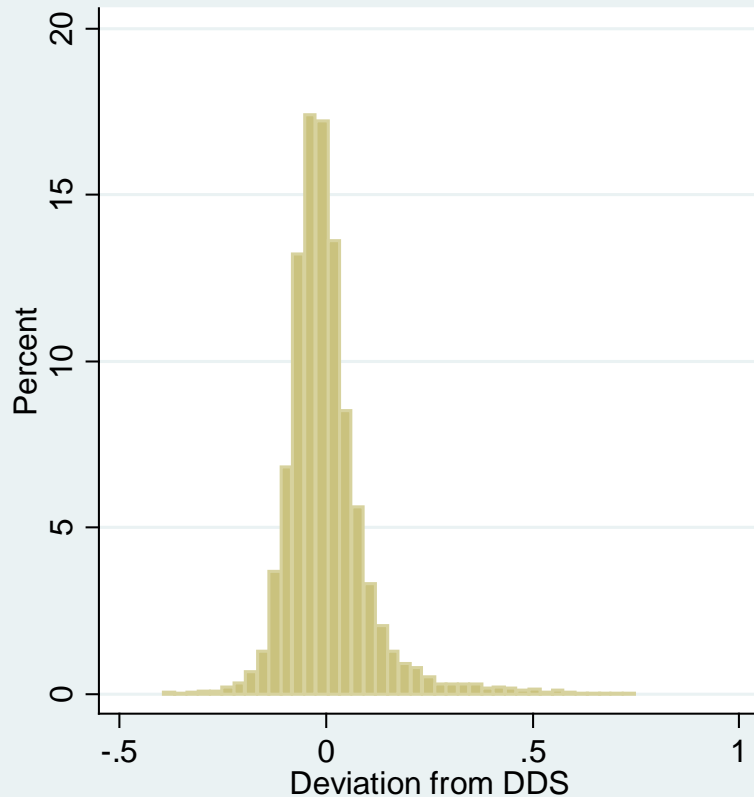
System Treats Mental and Musculoskeletal Cases Differently

Body System	Obs.	Allowance Rate		
		Initial	On Appeal	Ultimate
All	2,380,255	33.5%	31.0%	64.5%
Musculoskeletal	881,069	23.5%	37.7%	61.2%
Mental Disorders	513,884	42.5%	24.2%	66.7%

Key Findings

1/2 of all allowances granted on appeal,
2/3 of musculoskeletal allowances

Deviations from the Mean Allowance Rate by DDS Disability Examiner Raw and Adjusted for Case Mix



Source: DIODS
Data for 2005 and 2006
Examiners with 10 - 900 decisions only

Nearly 1 in 4 SSDI Entrants is Marginal

Sample	1 st -Stage Coefficient	Relative Likelihood
All	0.234***	1.00
Musculoskeletal	0.162***	0.69
Mental Disorder	0.350***	1.49
Ages 25-29	0.365***	1.56
Ages 55-59	0.148***	0.63
Low Past Earnings	0.071***	1.75
High Past Earnings	0.158***	0.68

Pooled 2005-06 sample.

Key Findings

- Nearly one-quarter of entrants are on the margin of initial allowance
- The marginal entrant has a mental disorder, is younger, and has low prior earnings

Causal Effect of SSDI Receipt on Labor Supply Two Years after Initial Decision

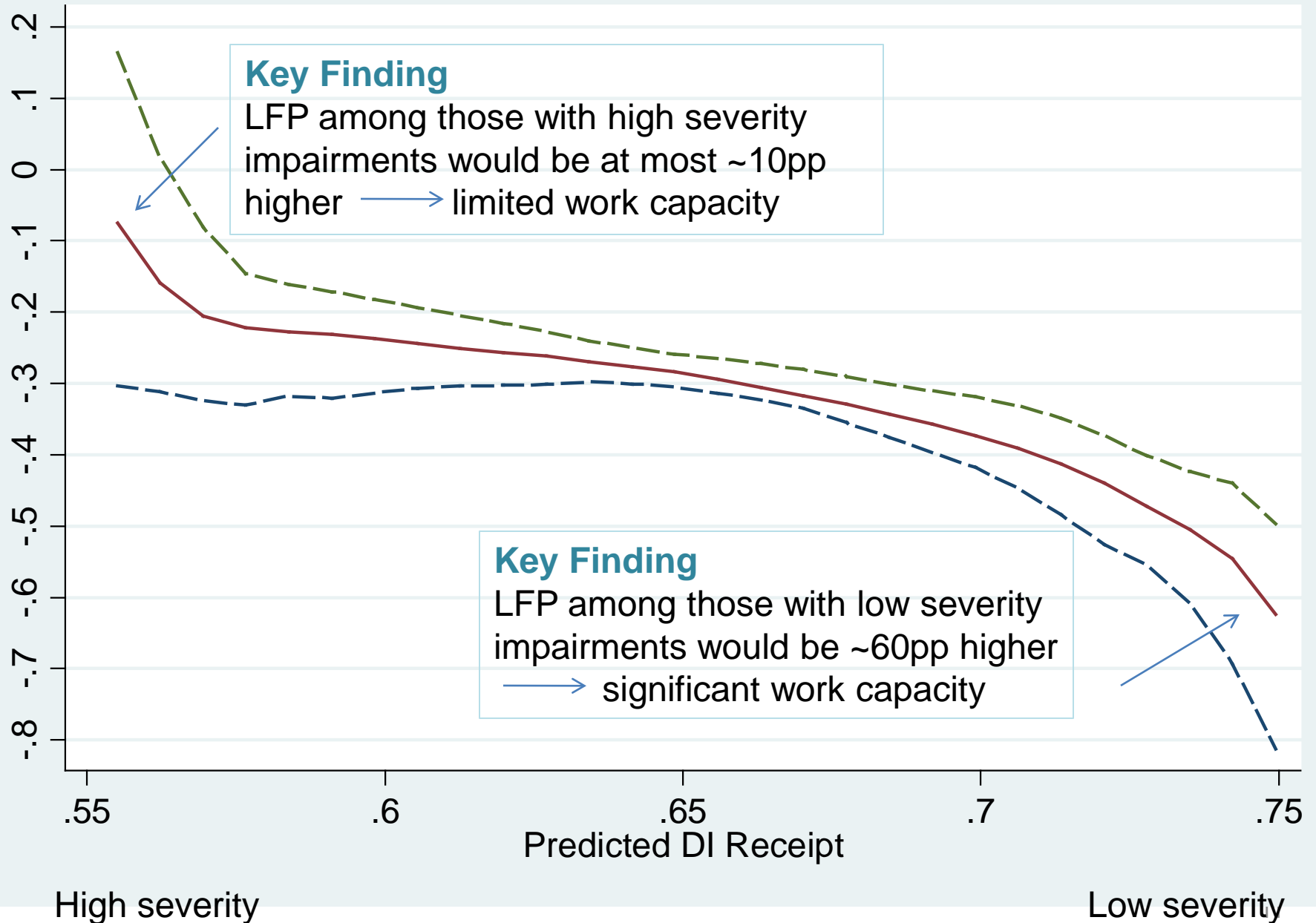
	Mean		OLS	IV
	Allowed	Denied		
LFP: Earnings \geq \$1000	0.154	0.516	-0.338***	-0.215***
LFP: Earnings \geq SGA	0.052	0.286	-0.235***	-0.129***
Earnings	\$2,012	\$8,671	-\$7,150***	-\$1,634***

Sample: 2005 initial decisions; control variables include diagnosis codes, age group dummies, avg. previous earnings, DDS dummies and month dummies.

Key Findings

On average, SSDI receipt causes a 21 pp reduction in LFP and \$1,600 loss in earnings for the marginal entrant

Estimated Marginal Treatment Effect



Do Long SSDI Application Processing Times Erode Human Capital?

Level	% of cases	Average time to decision
Initial	100	131 days (0.37 years)
Reconsideration*	27	279 days (0.76 years)
Administrative law judge (ALJ)	36	811 days (2.22 years)
Appeals council	<5	1,053 days (2.88 years)
Federal court	<1	1,720 days (4.71 years)

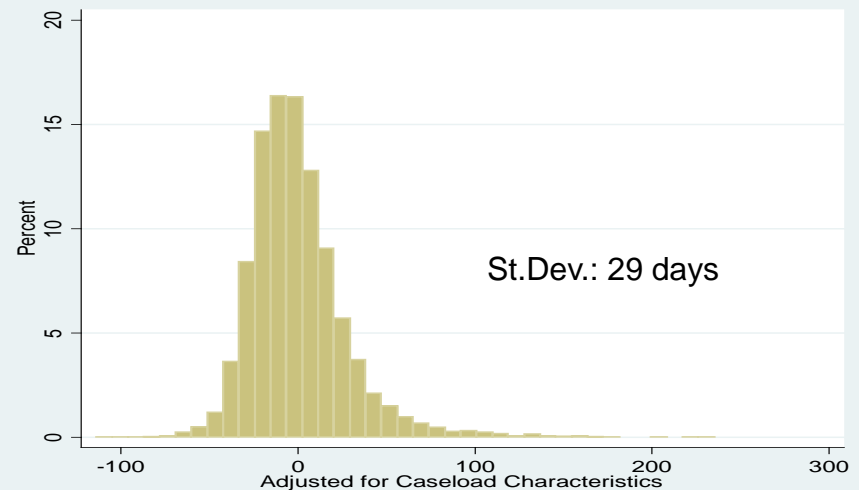
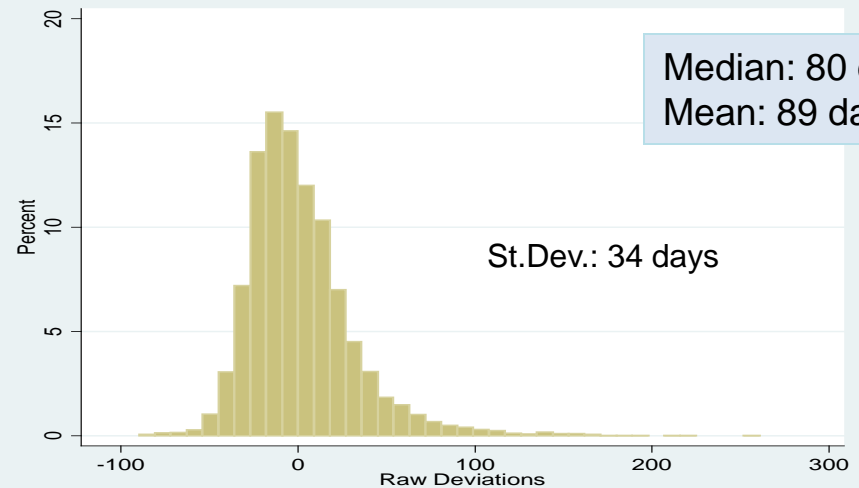
Source for % of cases: GAO (2004) and authors' tabulations. Source for processing time: Inspector General (2008).

* In 1999, 10 states eliminated reconsideration stage; they are Alabama, Alaska, California (Los Angeles North and West areas), Colorado, Louisiana, Michigan, Missouri, New Hampshire, New York (Brooklyn and Albany areas), and Pennsylvania.

Empirical Strategy

- Based on observation that some DDS examiners are **fast** while others are **slow**
- Instrument for applicant's total waiting time with examiner's average processing time

Deviations from the Mean Waiting Time by DDS Disability Examiner:
Raw and Adjusted for Caseload Characteristics



Source: 2005 DIODS Data
Examiners with 10 - 900 decisions only.
Caseload characteristics includes age, diagnosis, concurrent status and application month.

Applicants Lose Human Capital While They Wait

Preliminary Key Findings

Each month of waiting time

- Reduces LFP two years after the initial decision by $\frac{1}{2}$ pp
- Reduces annual earnings two years after the initial decision by \$86
- Appeals add 22 months waiting time on average \rightarrow 11 pp reduction in LFP, loss of \$1,900 annual earnings

Summary of Key Findings

- The marginal entrant is 21pp (40-140%) less likely to work if he receives SSDI
- But the effect varies with the severity of the impairment
 - Entrants with the least severe impairments are 60 pp less likely to work, while those with most severe impairments are only 10 pp
- Marginal entrant has mental impairment, is young and has low prior earnings
 - Greater expected program duration and medical costs
- 1/2 of all allowances granted by a judge, 2/3 of all musculoskeletal awards
- Long processing times impose significant losses in LFP and earnings on applicants

Backup slides

Figure 1. Five-Step Review Process

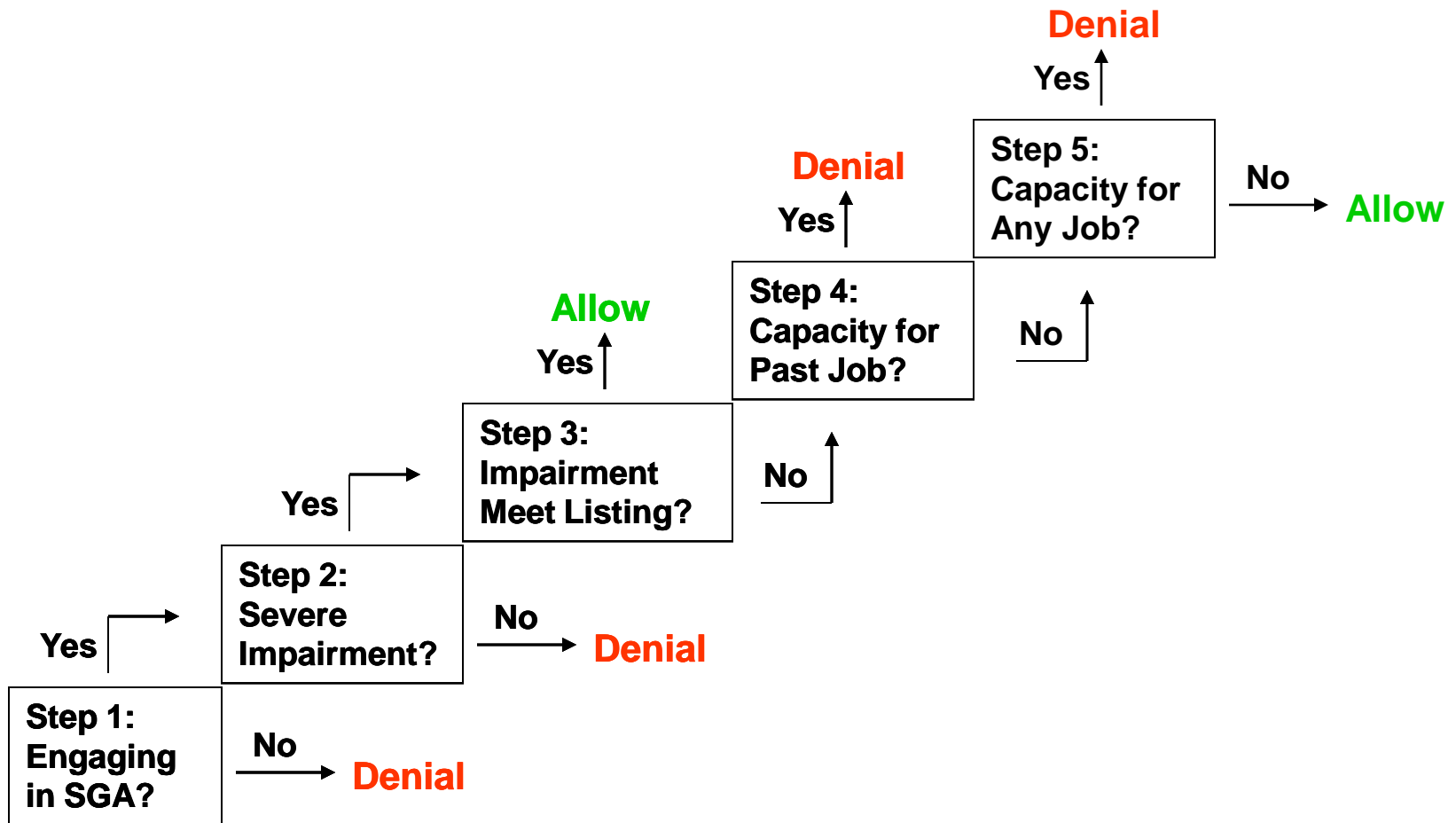
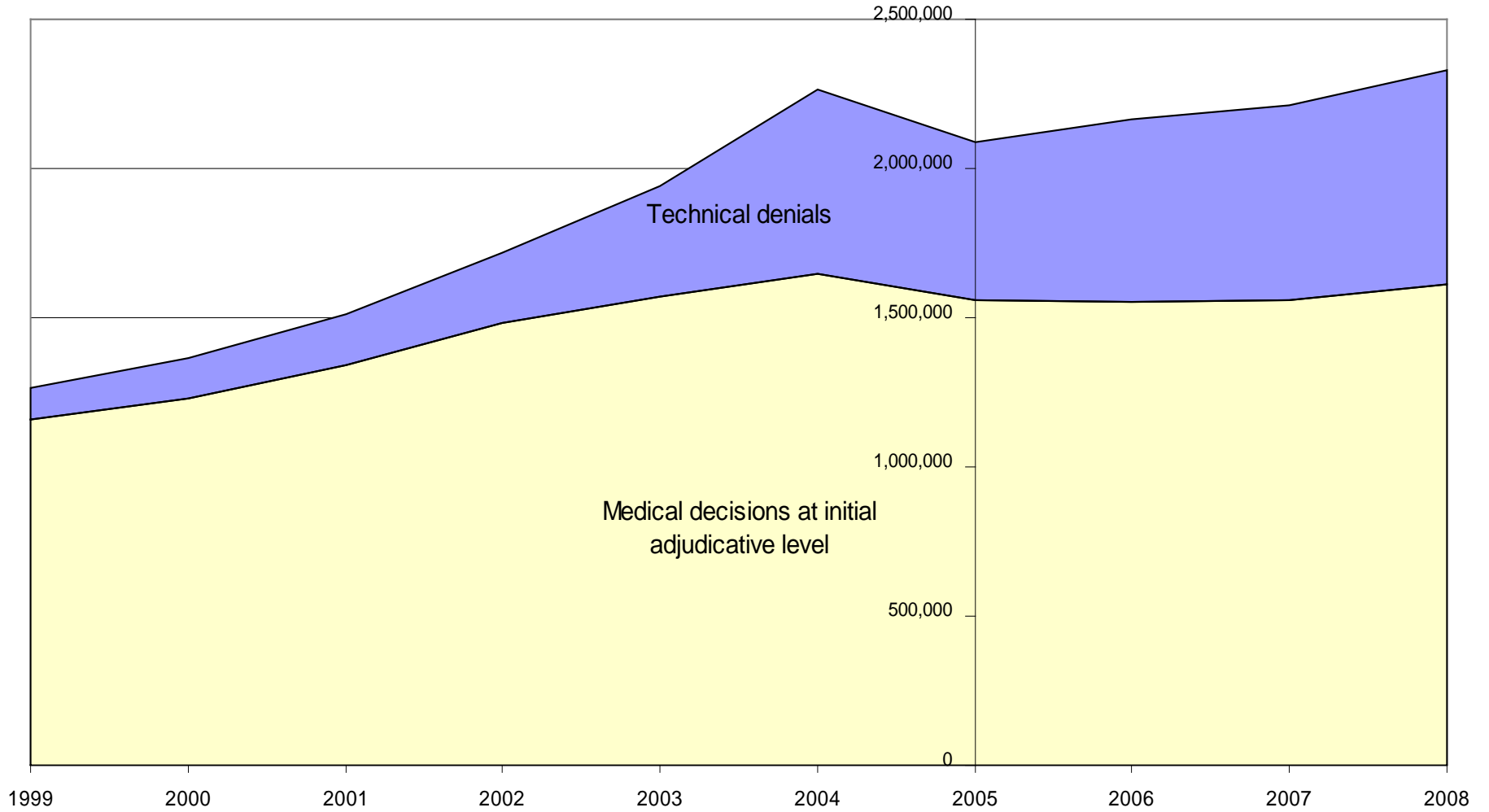


Figure 2. SSDI Applications, 1999-2008



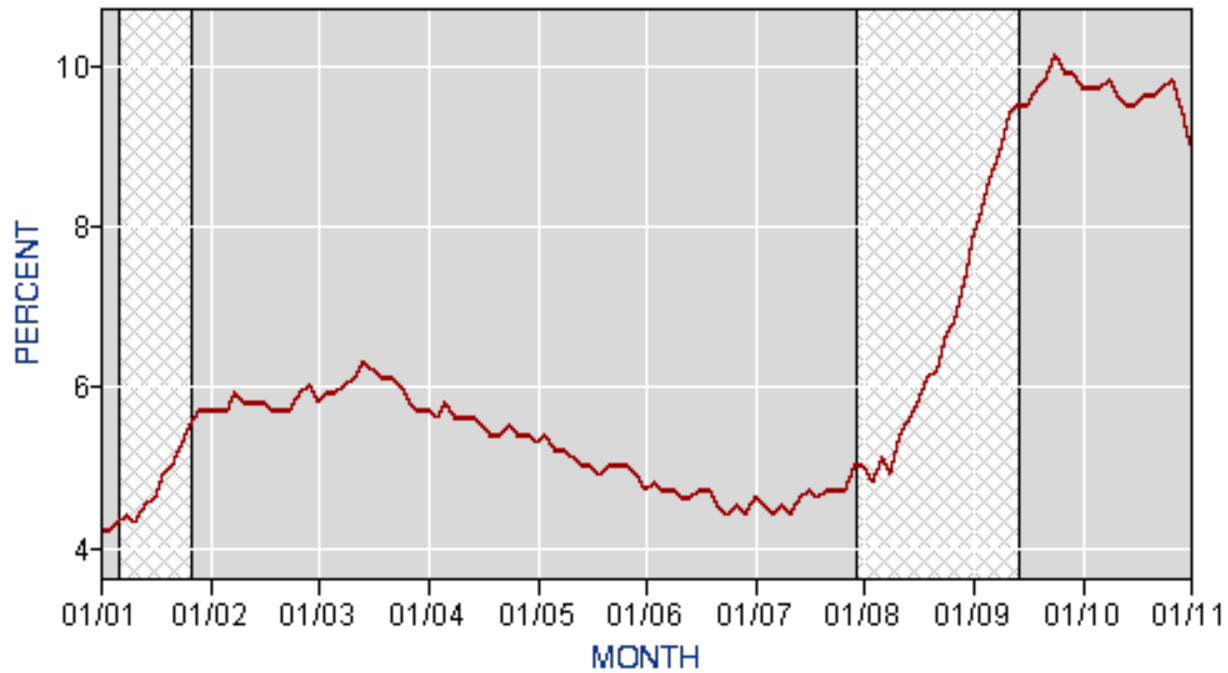
Source: Annual Statistical Report on the Social Security Disability Insurance Program, 2009

First stage using “leave body system out” measure of EXALLOW

Top Five Impairment Types

Body system	No. obs.	Coeff. on EXALLOW	t-stat.
Musculoskeletal	881,058	0.098	11.13
Mental disorders	513,884	0.251	21.48
Cardiovascular	195,183	0.166	10.99
Neurological	194,148	0.207	16.10
Endocrine system	98,801	0.065	2.78

Unemployment rate (seasonally adjusted)



Note: Cross-hatched area represents recession.

Source: Bureau of Labor Statistics, Current Population Survey

Heterogeneity: First stage

By Age

Age group	No. obs.	Allowance rate		Coeff. on EXALLOW	t-stat.	Relative likelihood
		Initial	Ultimate			
18-24	78,946	25.6%	40.2%	0.328***	13.61	1.40
25-29	136,461	23.0%	42.6%	0.365***	21.03	1.56
30-34	156,838	22.8%	48.2%	0.332***	18.98	1.42
35-39	211,452	22.4%	52.9%	0.278***	17.61	1.19
40-44	295,526	21.5%	56.6%	0.222***	16.63	0.95
45-49	370,632	22.4%	62.7%	0.195***	16.08	0.83
50-54	399,274	32.0%	72.9%	0.181***	18.56	0.77
55-59	413,497	50.1%	81.6%	0.148***	17.59	0.63
60-64	317,629	57.1%	72.5%	0.279***	24.74	1.19

Pooled 2005-06 sample.

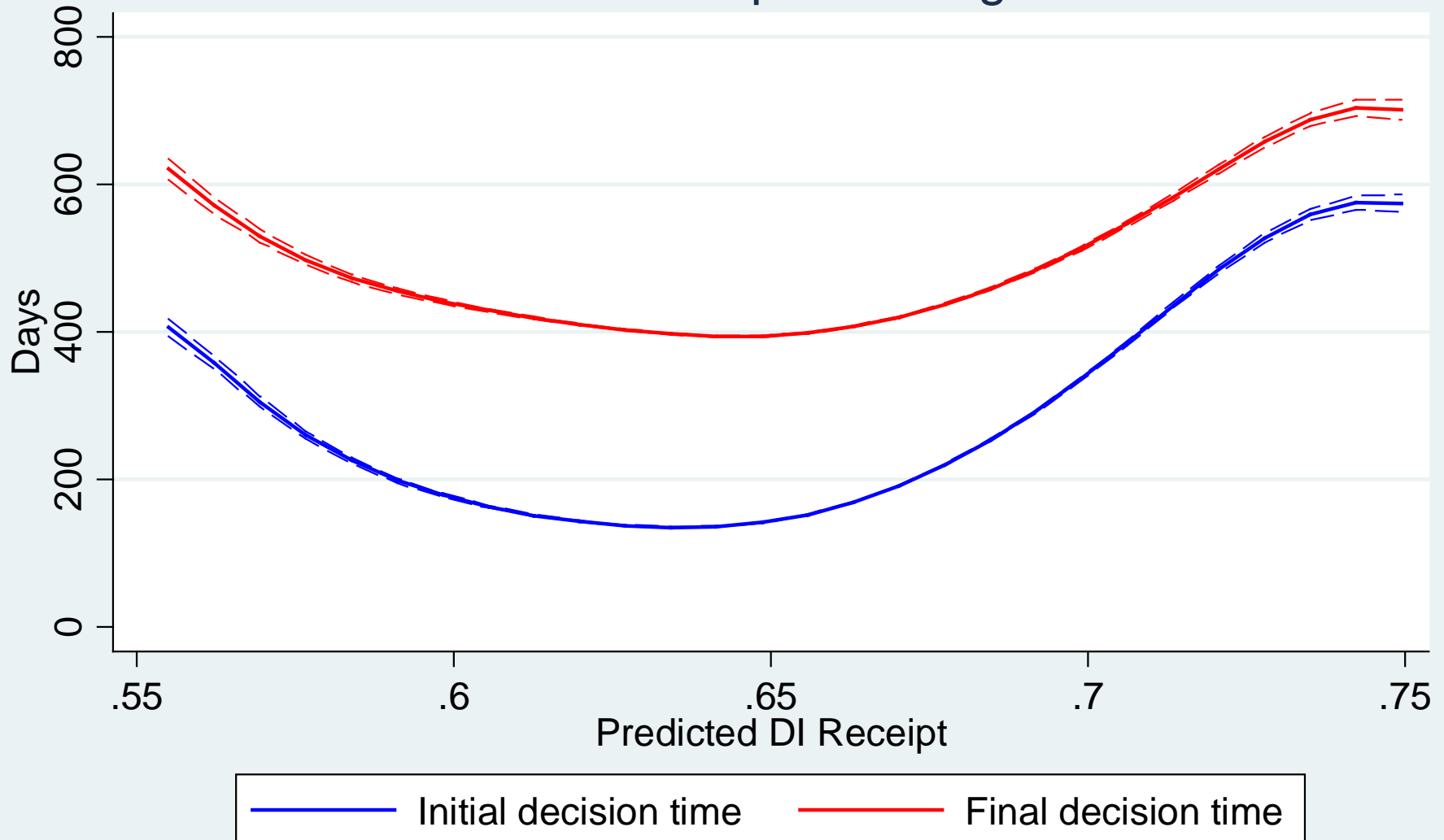
Heterogeneity: First stage

By Prior Earnings Quintile

Quintile	No. obs.	Allowance rate		Coeff. on EXALLOW	t-stat.	Relative likelihood
		Initial	Ultimate			
1 (bottom)	476,051	22.1%	44.2%	0.409***	30.62	1.75
2	476,051	27.2%	59.0%	0.254***	25.08	1.09
3	476,051	31.8%	66.9%	0.199***	20.85	0.85
4	476,051	38.4%	73.3%	0.181***	19.76	0.77
5 (top)	476,051	48.0%	79.3%	0.158***	19.84	0.68

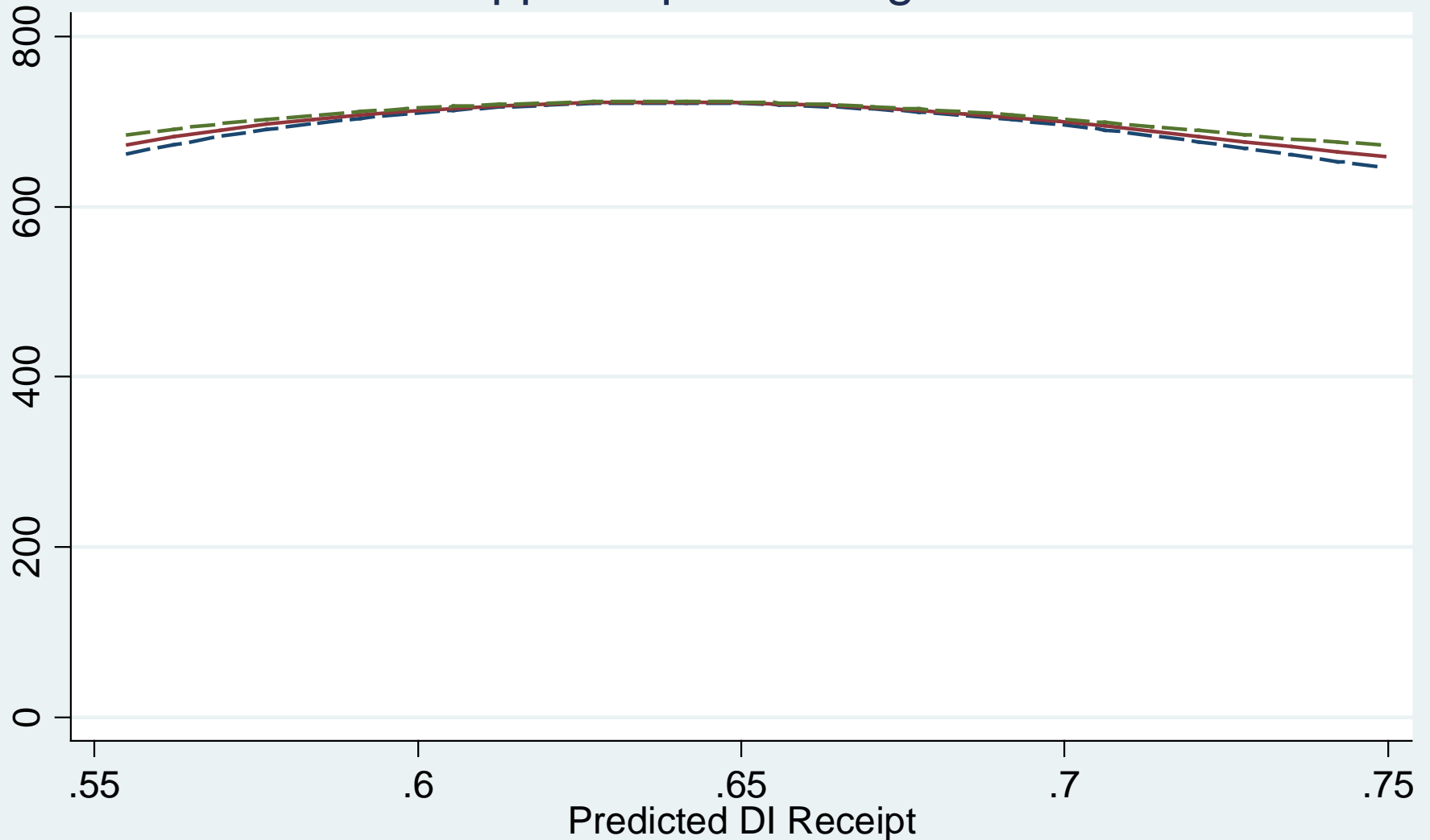
Pooled 2005-06 sample.

Initial and final processing times



Source: DIODS data for 2005 and 2006. Examiners with 10 - 900 decisions only.
Confidence intervals shown with dashed lines.
Final processing times are measured through the appeals stage.

Appeals processing time



Source: DIODS data for 2005 and 2006. Examiners with 10 - 900 decisions only.
Confidence intervals shown with dashed lines.
Final processing times are measured through the appeals stage.

Disability and labor supply

- Social Security Disability Insurance (SSDI) intended to replace lost wages due to onset of long-term, severe impairment that prevents work
- But dramatic rise in SSDI rolls and changing case mix have led many to question whether SSDI beneficiaries could work if they wanted
- Questions
 - Are SSDI beneficiaries capable of working?
 - Are we letting the “right” beneficiaries in?
- Important policy parameter = effect of SSDI on labor supply & earnings

Our contributions

- We use workload management database that allows us to match applicants to DDS examiners
- We exploit variation in allowance propensities among DDS examiners at **initial point in process**
- Our strategy allows us to estimate local average treatment effect, i.e., effect for marginal entrant
- We examine characteristics of marginal entrant
- Finally, we estimate heterogeneous treatment effects – **on both observed & unobserved dimensions**

Brief history of this estimate

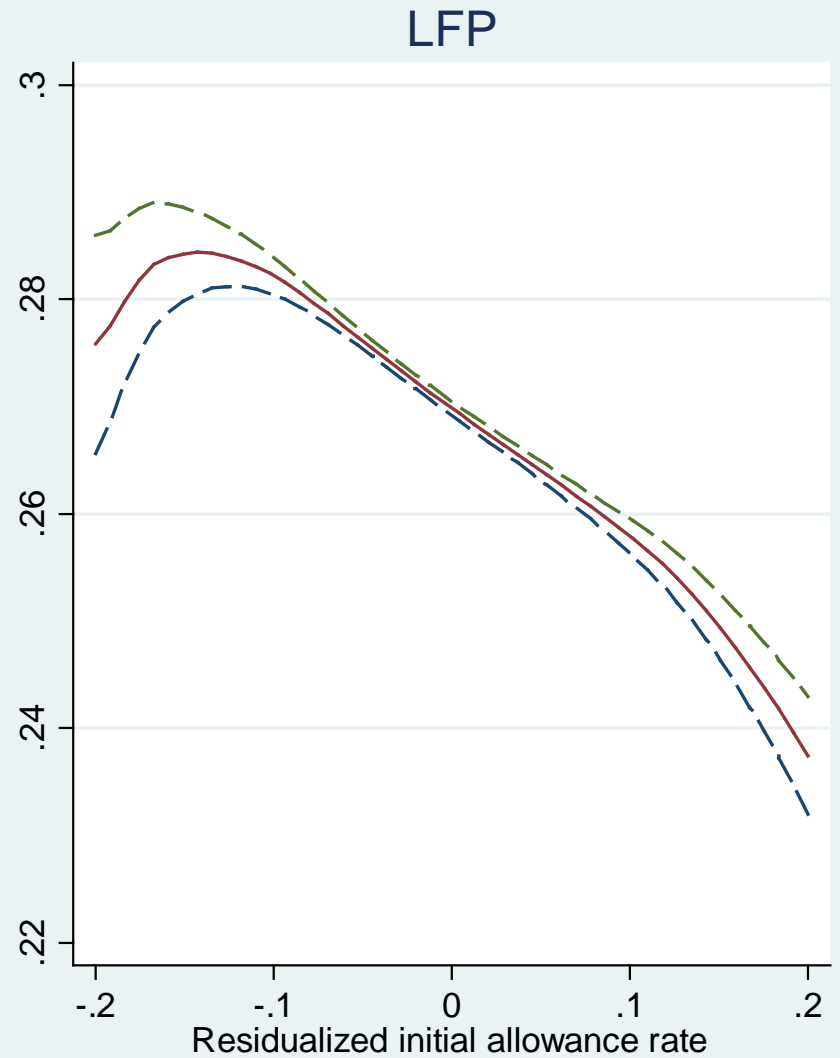
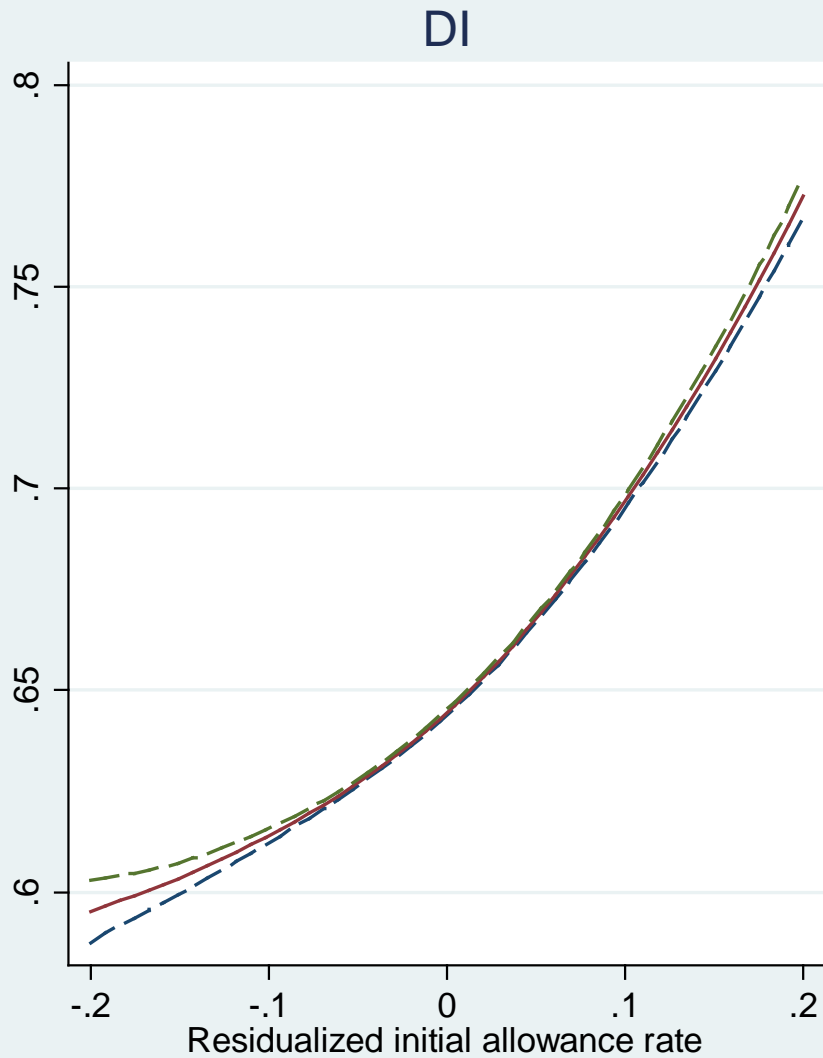
- Bound (AER 1989)
 - Proposed using denied applicants as control group for beneficiaries; upper bound (34pp)
- Chen & van der Klaauw (JOE 2008)
 - Exploited discontinuity in probability of allowance at age 55 (RD design) (20pp)
- French and Song (2011)
 - Use variation in allowance rates of judges at hearings level of appeals process (14pp)

Empirical strategy

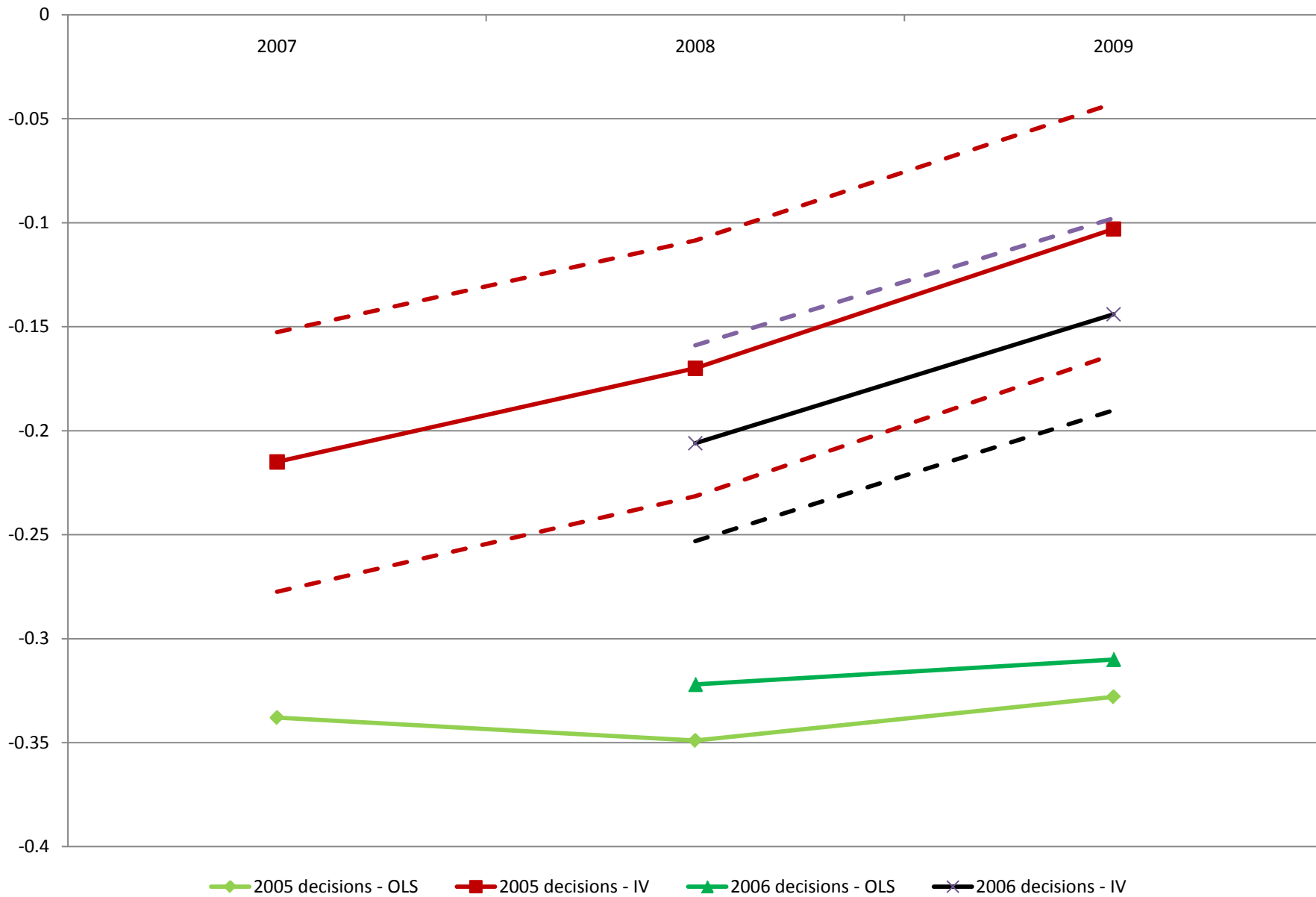
Two important assumptions:

1. Conditional random assignment of examiners to applicants
2. Monotonicity
 - Implies cases allowed by “strict” examiners will be allowed by “lenient” examiners
 - Examiners who are strict on, say, mental also strict on musculoskeletal cases

Figure 5. DI Receipt and Labor Supply by Initial Allowance Rate



Estimated Effects of SSDI Receipt on Labor Force Participation



First stage results

Dep. var. = ALLOW	(1)	(2)	(3)	(4)	(7)
Coefficient on EXALLOW	0.338***	0.330***	0.294***	0.235***	0.234***
	(50.14)	(53.13)	(42.74)	(37.97)	(38.42)
Covariates					
3-digit zip codes		X			
Body system codes			X		
Diagnosis codes				X	X
Age, previous earnings, month-year dummies					X

2005-06 decisions pooled. All regressions include DDS dummies; mean dependent variable is 0.65, mean EXALLOW is 0.37; t-statistics in parentheses. Std errors clustered on examiner.

Computing the MTE

Following Heckman, Urzua and Vytlacil (ReStat 2006)

1. Estimate probit of DI receipt on residualized EXALLOW
2. Estimate local quadratic regression of LFP on predicted DI receipt
3. Take numerical derivative

Heterogeneity: Second stage

Top Five Impairment Types

Body system	No. obs.	Mean LFP Allowed	OLS		IV	
			Coeff.	t-stat.	Coeff.	t-stat.
Musculo-skeletal	881,069	0.13	-0.35***	303.13	-0.20***	4.33
Mental disorders	513,884	0.19	-0.32***	204.78	-0.21***	7.78
Cardio-vascular	195,183	0.12	-0.32***	131.96	-0.33***	4.43
Neuro-logical	194,148	0.12	-0.37***	140.74	-0.26***	4.60
Endocrine system	98,801	0.13	-0.31***	101.82	-0.40	1.39

Outcome is LFP 2 years later for pooled 2005-06 sample.

Heterogeneity, Part II

- Continuous instrument allows us to estimate marginal treatment effect (MTE)

$$\frac{\partial E[Y | P(Z)]}{\partial P(Z)}$$

- Margin = examiner's allowance propensity
- Applicants on margin for "strict" ("lenient") examiner have higher (lower) severity
- Thus, MTE traces labor supply effect as function of **unobserved severity**