All or Nothing: Health and the U.S. Social Security Disability Insurance

Ivan Suvorov

UNC-Chapel Hill

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Public Disability Insurance Program in the US

- One of the most fundamental questions in health and public economics is how income from government programs influences beneficiaries' health
- The Social Security Disability Insurance (SSDI) program is the main disability insurance program for disabled individuals in the US
- 10M Americans receive SSDI benefits at a cost of $12B/month
- The most recent reform of SSDI was introduced in 1999

Public Disability Insurance Program in the US

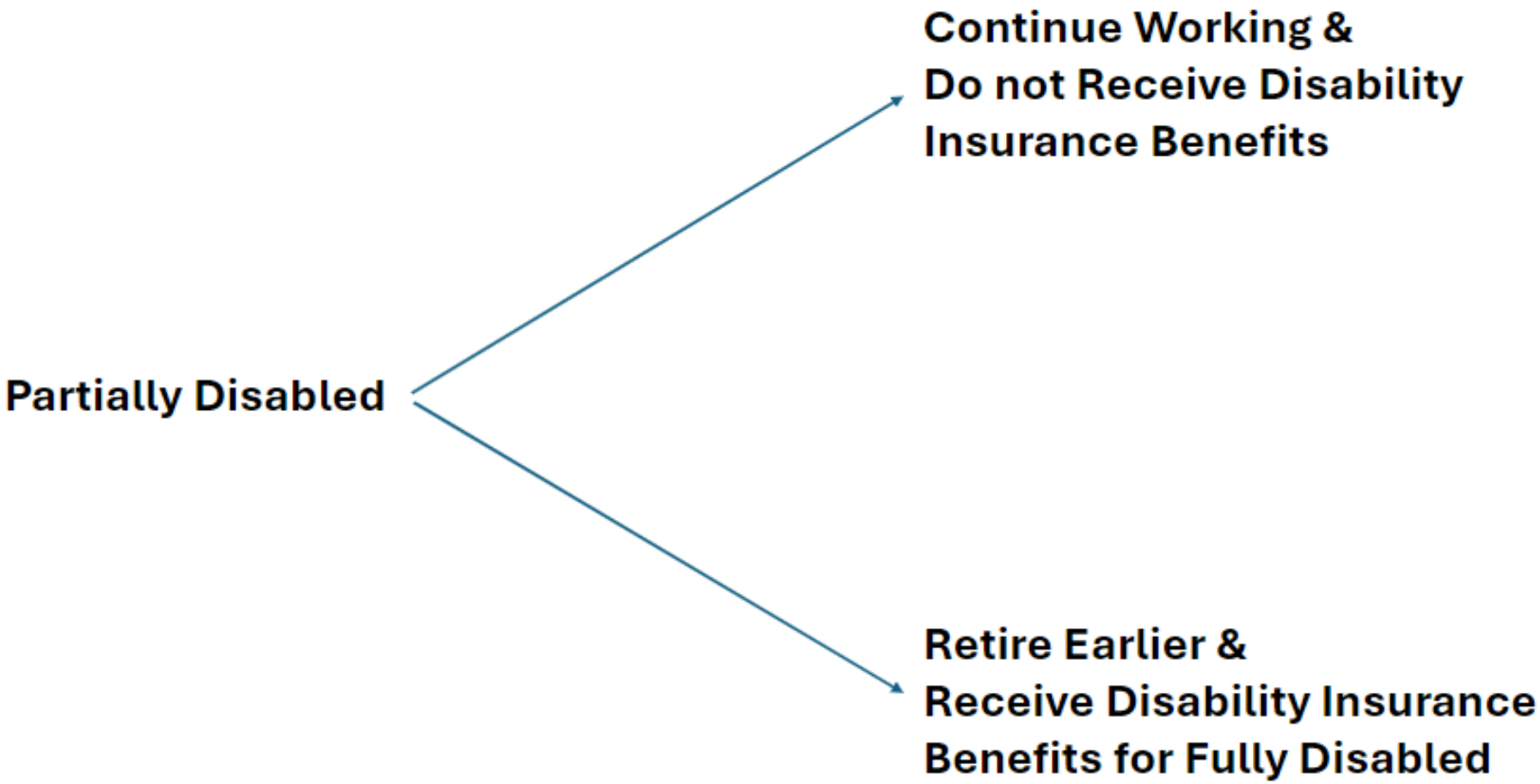
- SSDI eligibility criteria treat health as a binary outcome:
  a person is either considered to be fully disabled or not disabled

- This dichotomy incentivizes applicants to exaggerate or even exacerbate their health problems and leave the labor force prematurely

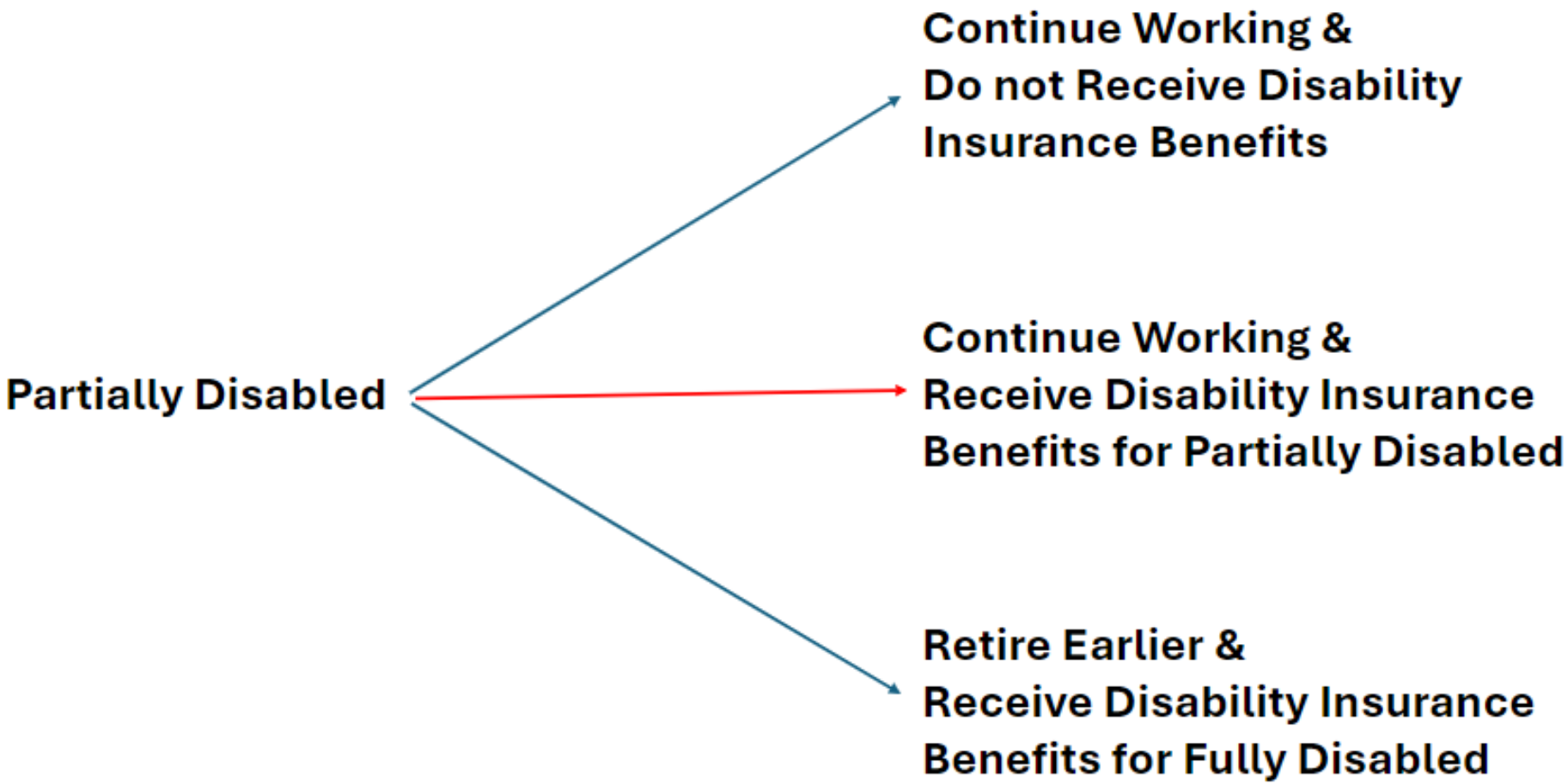
  - Around 20% of SSDI beneficiaries have some capability to return to work — they are not fully disabled.

  - Less than 1% of SSDI recipients return to the labor force

Public Disability Insurance Program in the US



Public Disability Insurance Program in Other Countries



Disability Insurance Program for the Partially Disabled

The extension of the SSDI program to the partially disabled will affect health through three main channels:

- Labor supply (reservation wage changes)
- Income (additional SSDI benefits)
- Health insurance coverage (employer-sponsored and early Medicare)

Research Question

How will the extension of disability insurance to the individuals with the partial disability impact the longevity and disability propensity of the nearly elderly and the elderly?

Preview of the Results

The introduction of partial disability insurance (DI) in the US will

- Increase labor supply of partially disabled individuals
  The share of the partially disabled working part-time rises by up to 14 p.p.
- Decrease the number of disabled Americans by around 1%
- Increase the life span of $\sim 30,000$ people by 5 years, extend lives of $\sim 20,000$ by 15 years, and raise life longevity of $\sim 10,000$ by 20 years
- Cost of extending the life of one person by one year is \$17K

Literature on Disability Insurance

Empirical approach	Focus on effects of disability insurance on	
	Health	Labor supply
Reduced form models	Borsch-Supan et al. (2017) Black et al. (2021) Gelber et al. (2023)	Gilleskie & Hoffman (2014)
Individual decision-making models that permit the prediction of effects of modifications of SSDI design	**This paper**	Yin (2015)

Data and Sample Design

Two sources of the data:

1. Health and Retirement Study (HRS) Public Survey Data (1994–2016)
2. Social Security Administration (SSA) Administrative Data

Estimation sample restrictions:

1. The age range is from 50 to 90
2. No missing data on key health-related variables and age
3. No missing initial conditions

HRS Questions on Disabilities Preventing Work

HRS has the following questions on disabilities preventing work:

- Do you have any impairment or health problem that limits the kind or amount of paid work you could do?
- Does this limitation keep you from working altogether?

I classify individuals by disability statuses as follows:

- **partially disabled** — those who have limitations that limit their work but do not prevent them from working altogether
- **fully disabled** — those who have limitations keeping them from working altogether

Self-Reported Disability Status is Unreliable

Questions on disabilities preventing work are unreliable because:

- People report themselves in poor health as a rationalization for what might otherwise be seen as socially unacceptable early retirement (Bound, 1991)
- 20% of HRS respondents who reported receiving SSDI benefits also reported that their disability does not prevent them from working altogether (Benitez-Silva et al., 2004)
  - So, 20% of SSDI beneficiaries admit they are cheating
  - How many respondents decided not to admit their fraud?

Health Index Construction

I construct a health index summarizing all available data on the individual health using principal component analysis for the following HRS health-related variables:

1. Self-reported health status (excellent/very good/good/fair/poor)
2. 2 variables related to healthcare utilization
3. 8 variables related to mental health issues
4. 8 variables related to doctor-diagnosed health problems
5. 10 variables related to difficulties with the activities of daily living and instrumental activities of daily living
6. Self-reported back pain

Model

Decisions of Agents and Health Measures

- Agents make decisions about:
  - Labor supply: full-time, $w_t^i = 1$, part-time, $w_t^i = 2$, no work, $w_t^i = 0$
  - Disability insurance benefits application, a_t^i:
    - $a_t^i = 1$, if an individual is eligible for full SSDI benefits and claims them
    - $a_t^i = 2$, if an individual is eligible for partial SSDI benefits and claims them
    - $a_t^i = 0$, otherwise
  - Social Security Old-age (SSOA) benefits receipt starting year, s_t^i
    - $s_t^i = 1$, if an individual is eligible for SSOA benefits and starts benefits this year
    - $s_t^i = 1$, otherwise
- Health measures
  - Disability status: fully disabled (FD), $D_t^i = 1$, partially disabled (PD), $D_t^i = 2$, not disabled, $D_t^i = 0$
  - Health index, H_t^i, a continuous measure of health

Model

Utility Function

Utility=log(Consumption)(Marginal utility of consumption) +

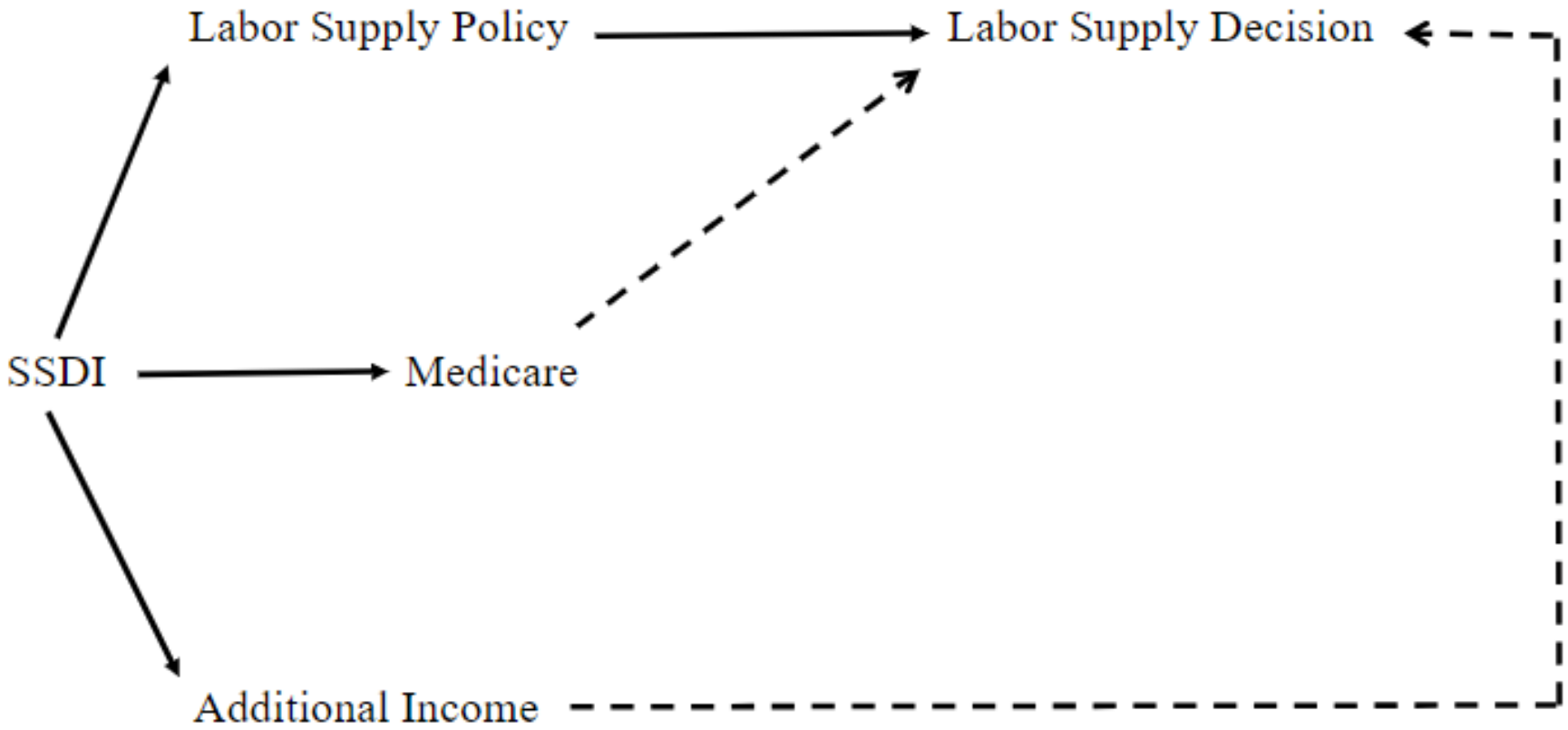
+ Utility of employment transitions +

+ Utility of SSDI application by disability and SSOA statuses,

All utilities are the sums of a constant and a coefficient times the health index

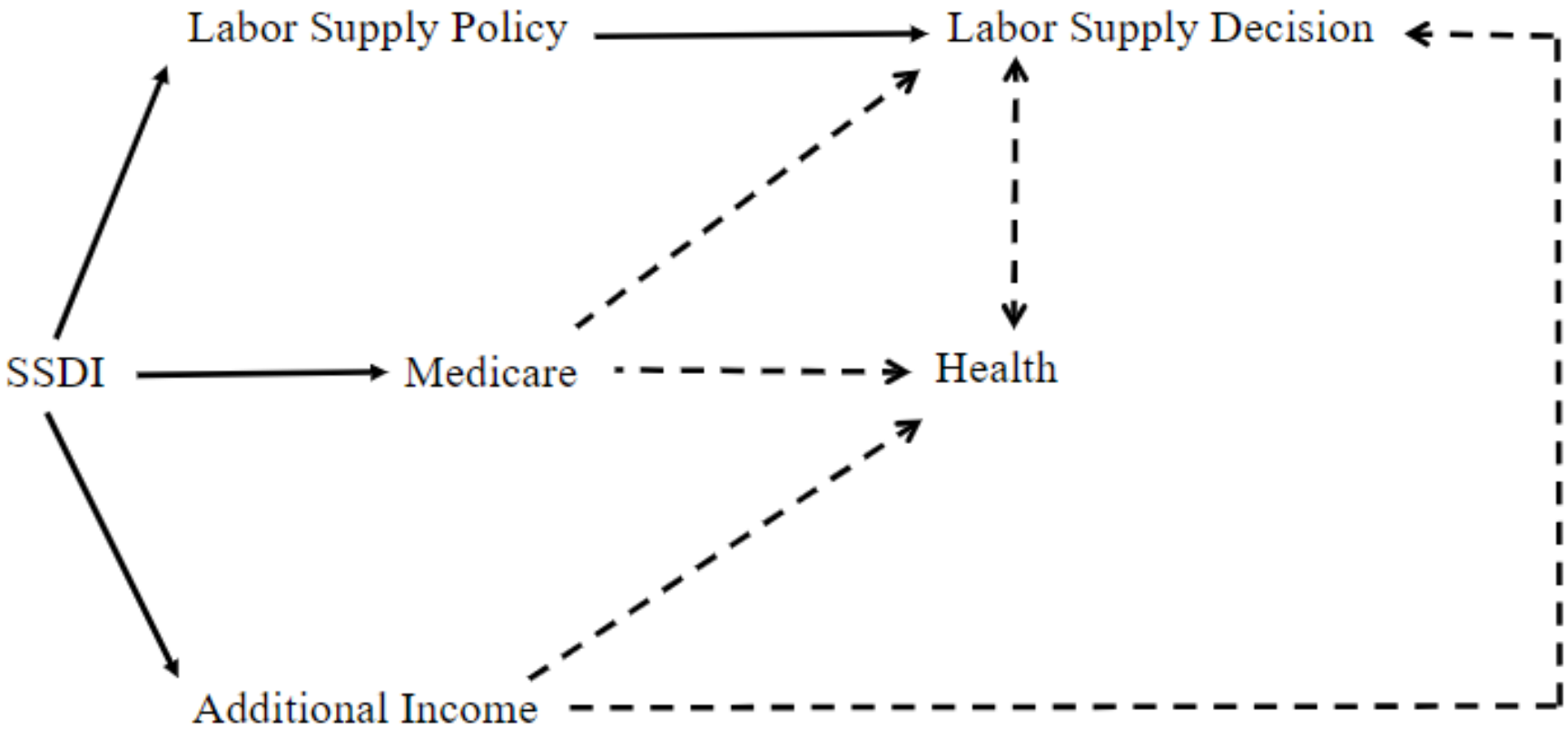
Model

SSDI and Labor Supply Decision



Model

Labor Supply Decision and Health



Model

Health measures

Mortality rate, $M^i_{t+1}(\cdot)$, disability status, $D^i_{t+1}(\cdot)$, health index, $H^i_{t+1}(\cdot)$, are the functions of previous

- labor supply decisions, w^i_t, by disability status, D^i_t, and education, E^i_t
- health insurance: I^i_t, by disability status, D^i_t, and education, E^i_t
- consumption: C^i_t, by disability status, D^i_t, and education, E^i_t
- disability status: D^i_t
- health index: H^i_t
- age: A^i_t
- college education: E^i_t

Model

Health measures

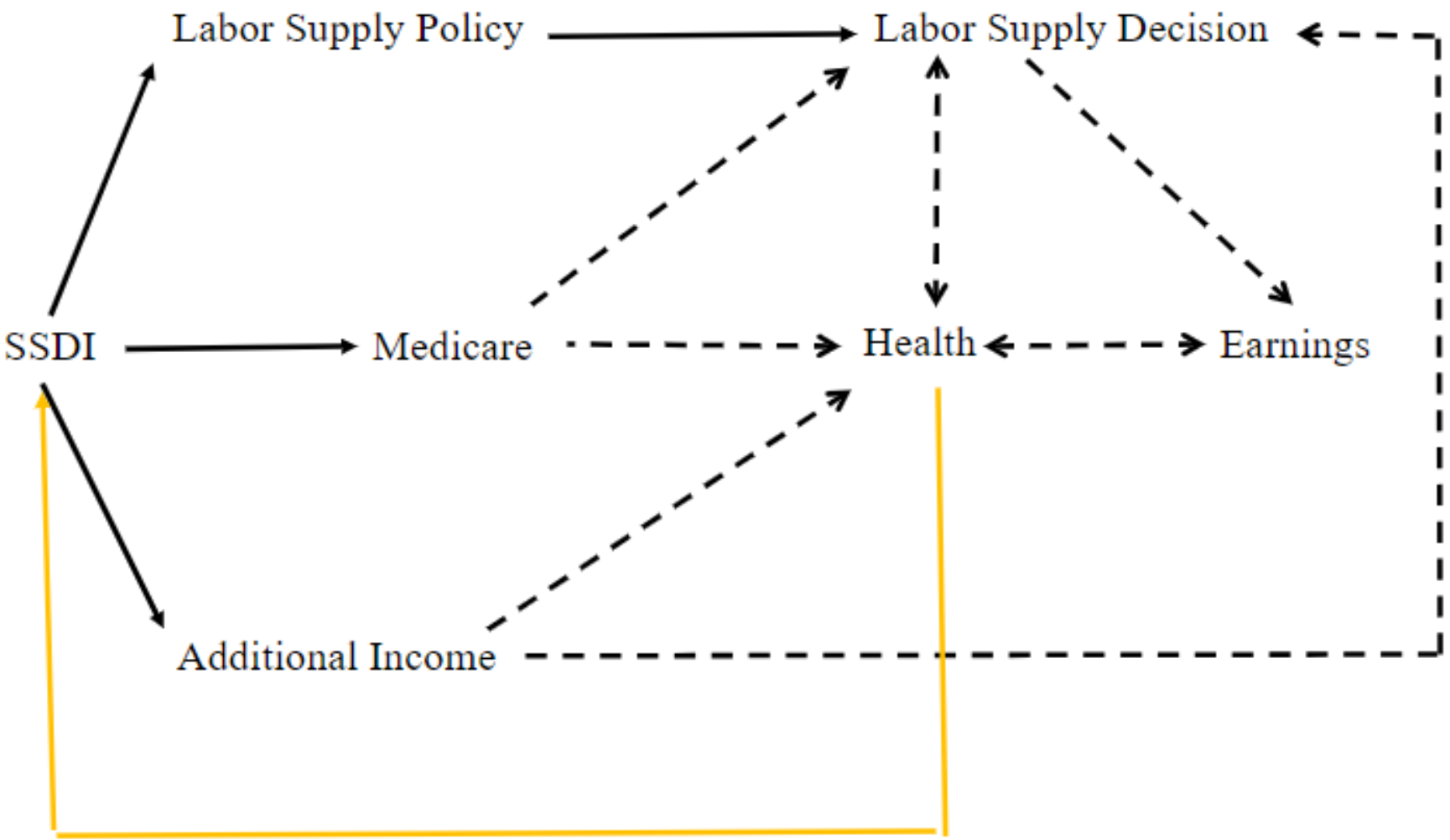
The effects of labor supply (w_t^i), consumption (C_t^i), and health insurance (I_t^i) on mortality rate, $M_{t+1}^i(\cdot)$, disability status, $D_{t+1}^i(\cdot)$, and health index, $H_t^i(\cdot)$, are β_t^{kli}, where $k \in \{w, C, I\}$ and $l \in \{M, D, H\}$

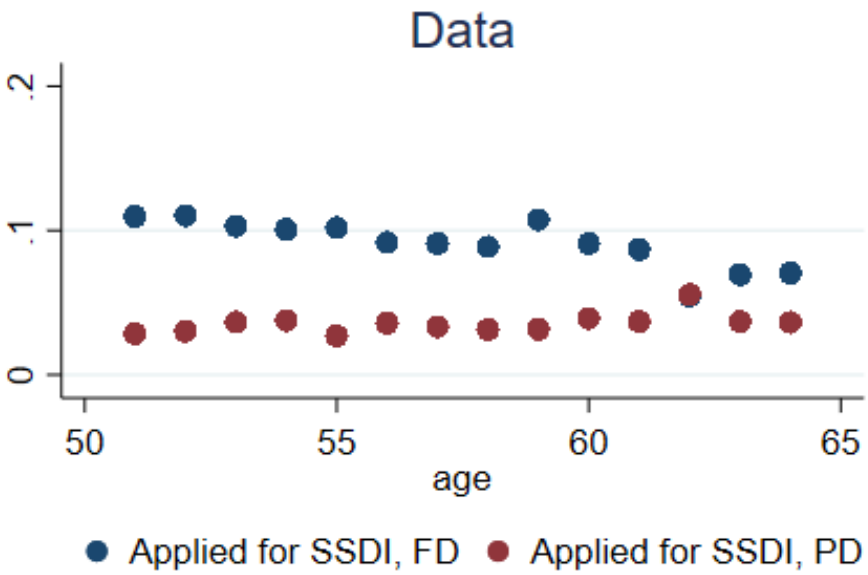
These effects are heterogeneous for the partially disabled:

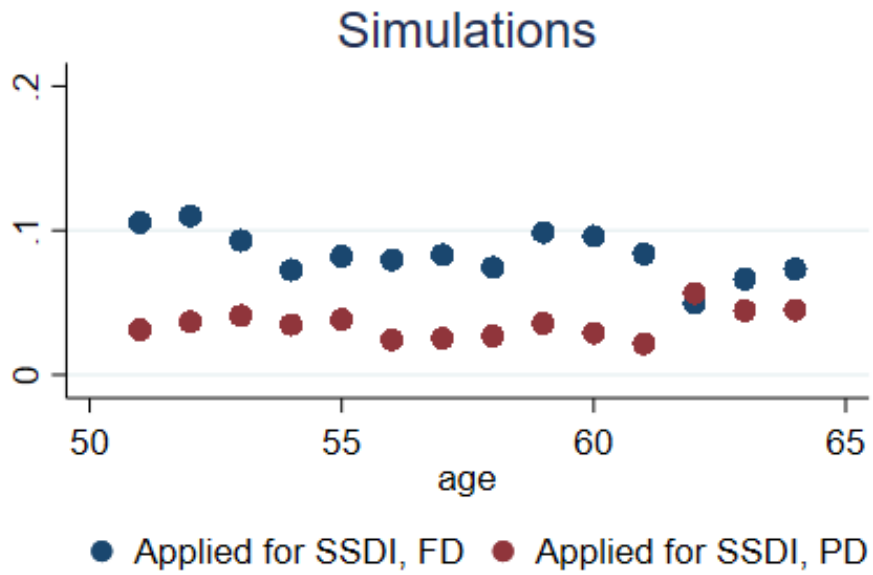
$$\beta_{it}^{kl} = \gamma^{kl} + \epsilon_{it}^{kl},$$

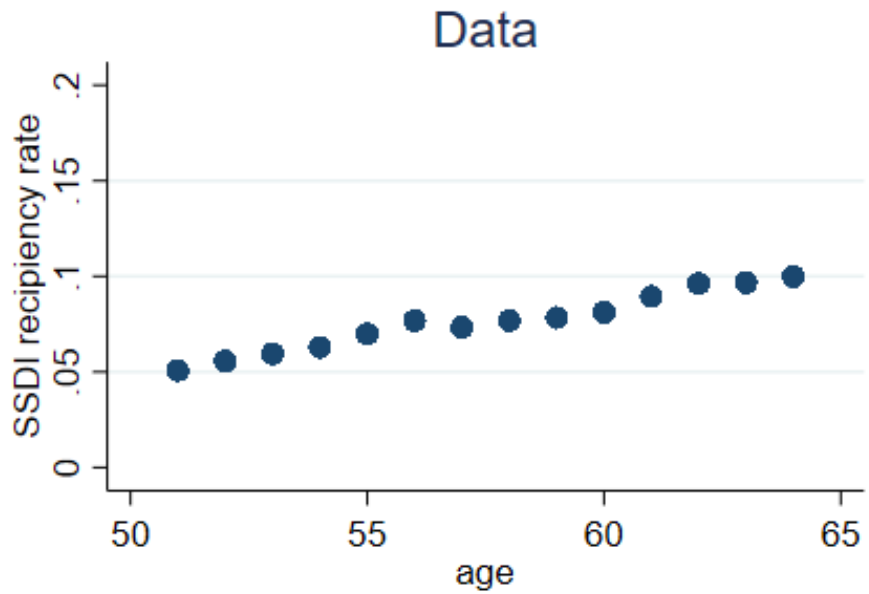
where γ^{kl} is a constant and ϵ_{it}^{kl} is i.i.d. normal shock

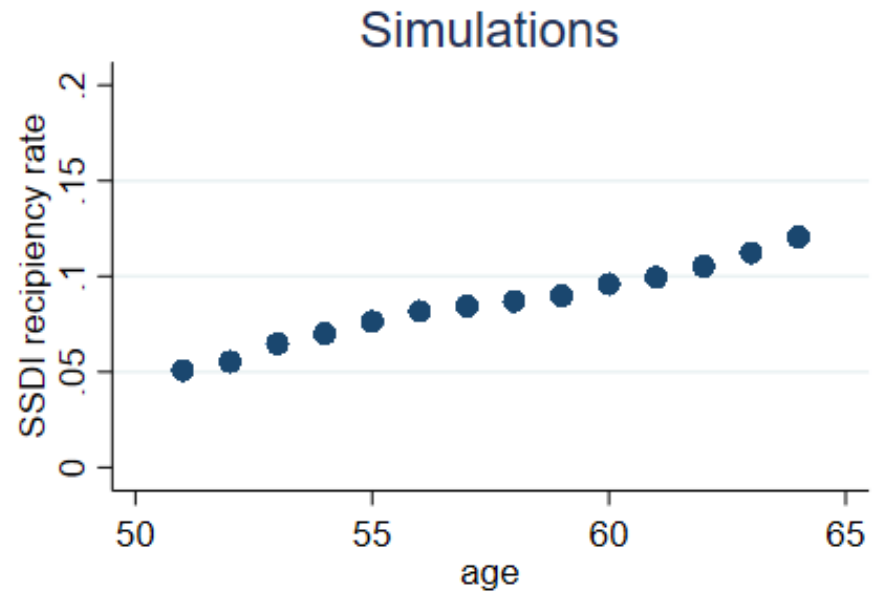
Model

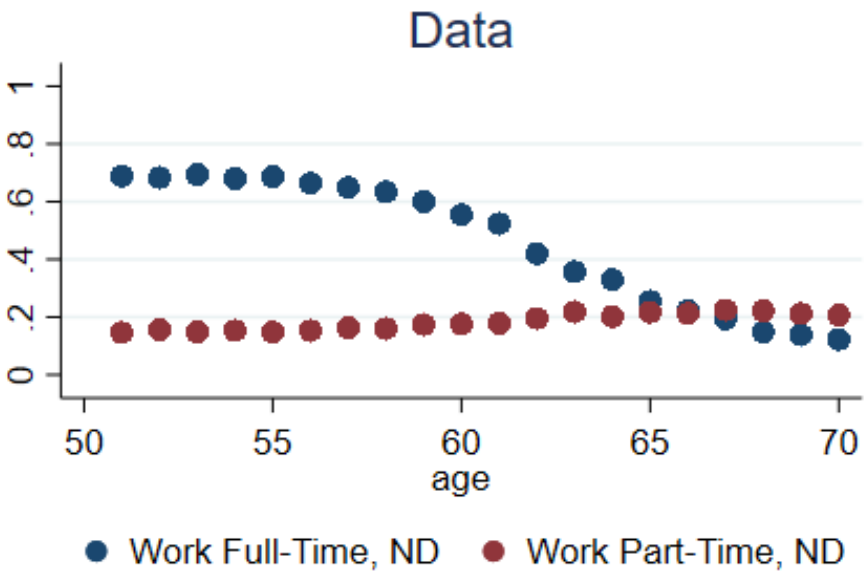

Labor Supply Policy
Labor Supply Decision
SSDI
Medicare
Health
Earnings
Additional Income

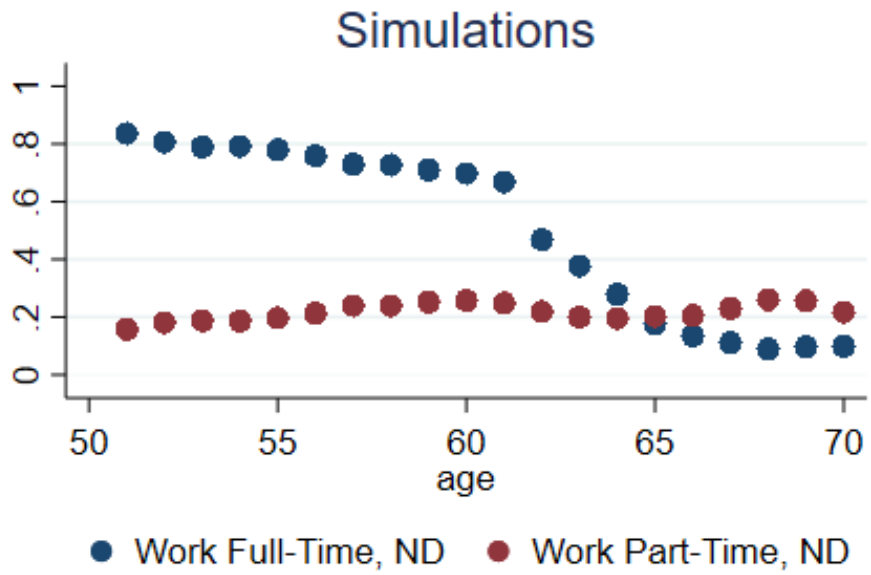

Data
0
.1
.2
50
55
60
65
age
Applied for SSDI, FD
Applied for SSDI, PD

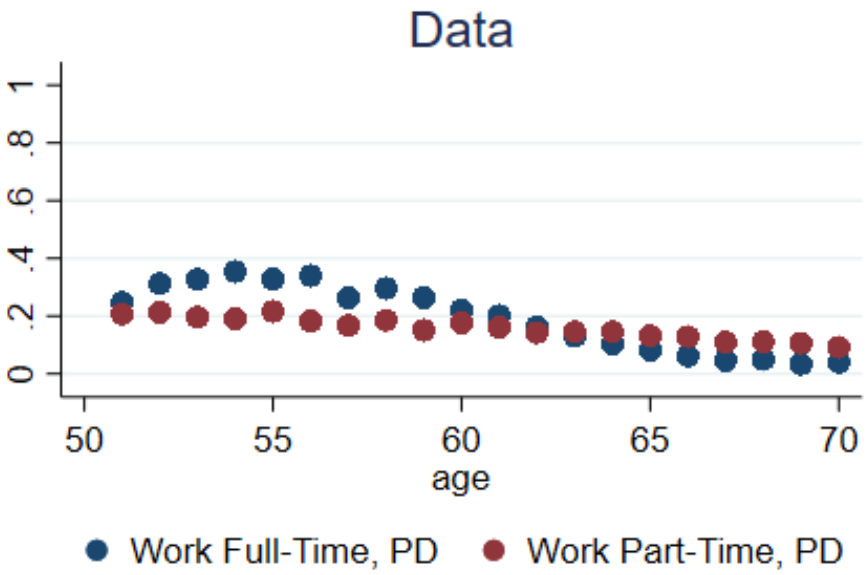

Simulations
0
.1
.2
50
55
60
65
age
Applied for SSDI, FD
Applied for SSDI, PD

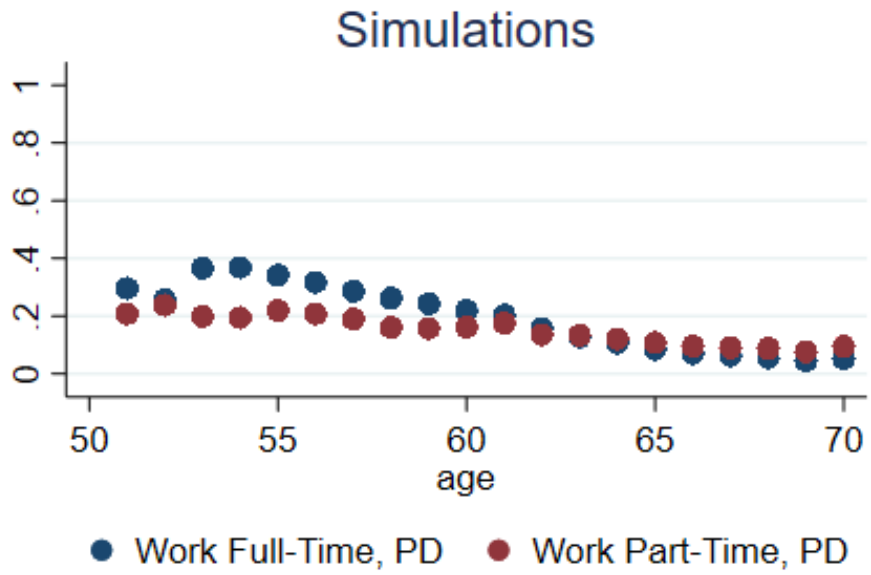

Data
SSDI recipiency rate
0
.05
.1
.15
.2
50
55
60
65
age

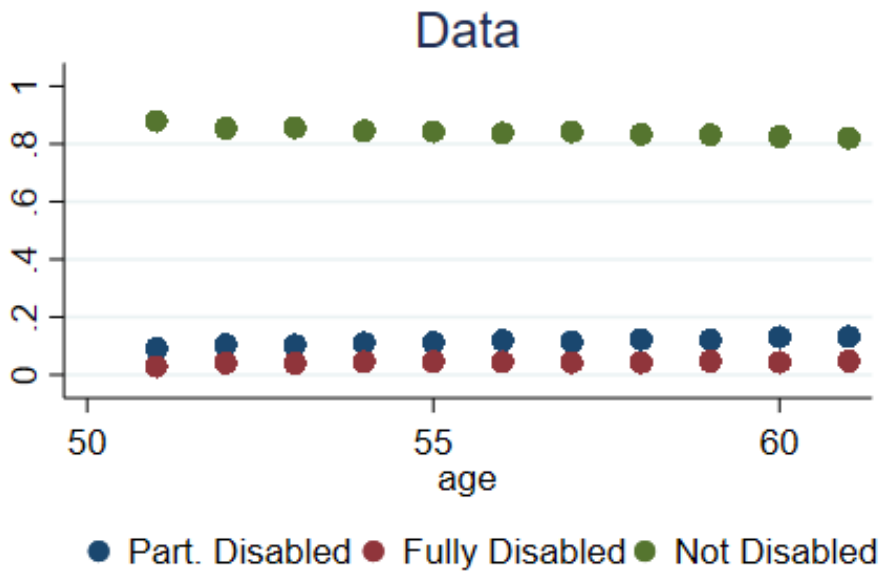

Simulations
SSDI recipiency rate
0
.05
.1
.15
.2
50
55
60
65
age

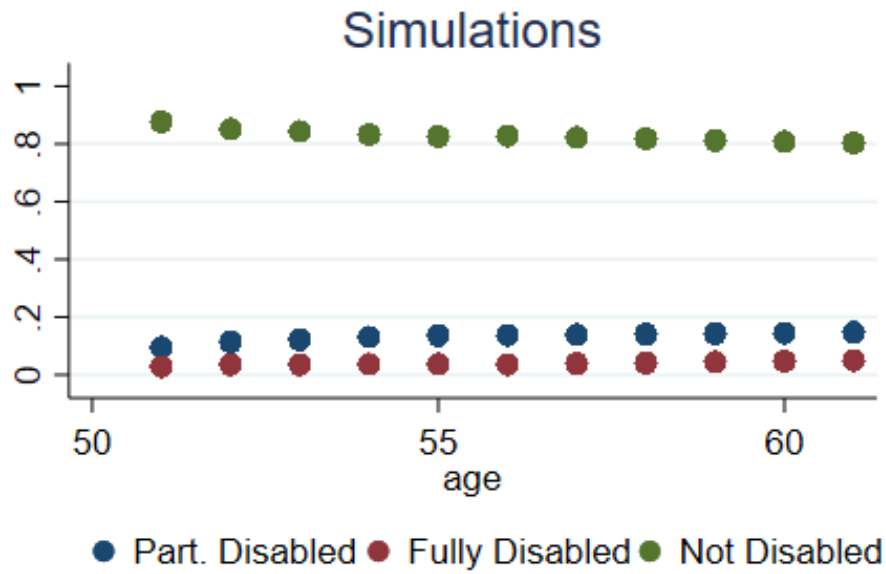

Data
0 .2 .4 .6 .8 1
50 55 60 65 70
age
Work Full-Time, ND
Work Part-Time, ND

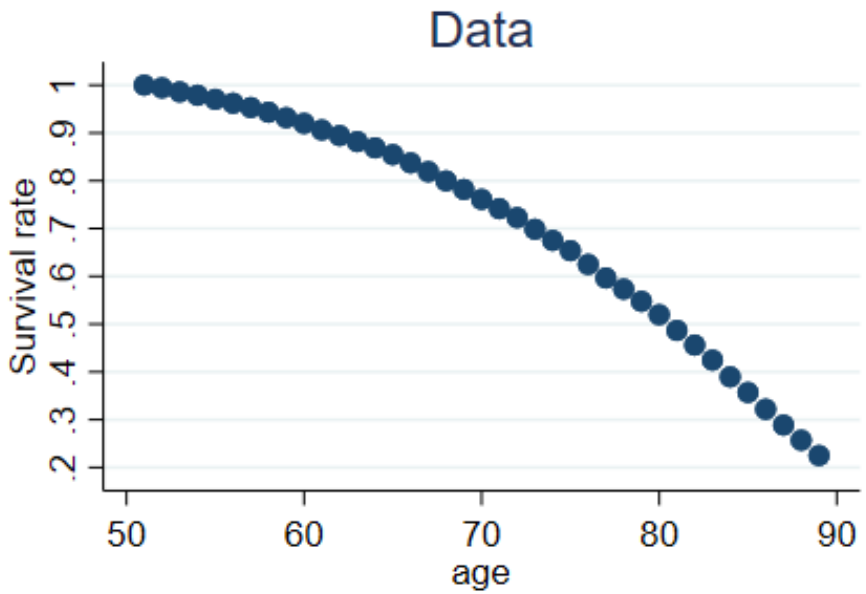

Simulations
0 .2 .4 .6 .8 1
50 55 60 65 70
age
Work Full-Time, ND
Work Part-Time, ND

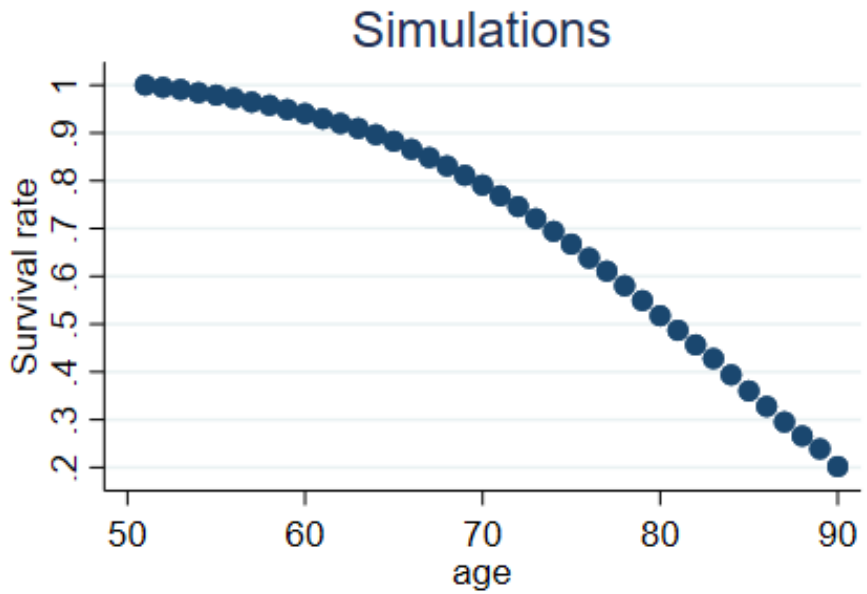

Data
0 .2 .4 .6 .8 1
50 55 60 65 70
age
Work Full-Time, PD
Work Part-Time, PD

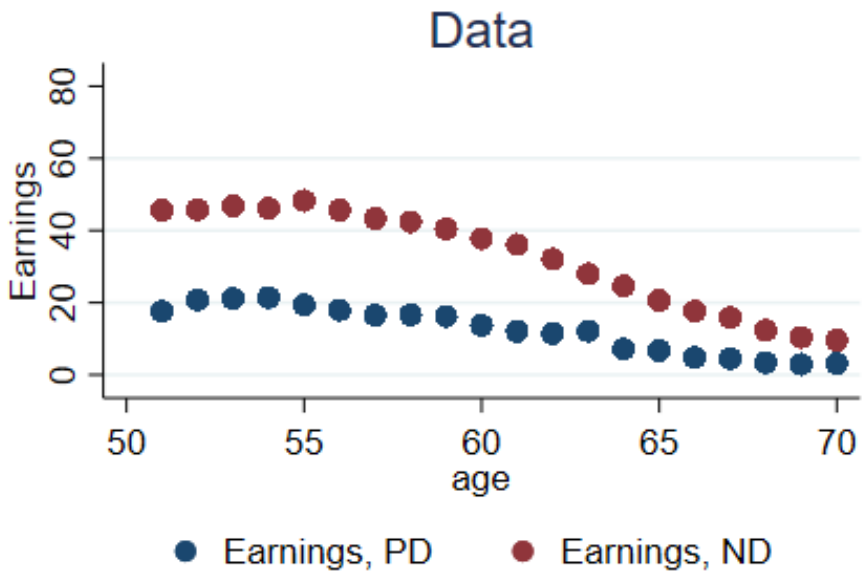

Simulations
0 .2 .4 .6 .8 1
50 55 60 65 70
age
Work Full-Time, PD
Work Part-Time, PD

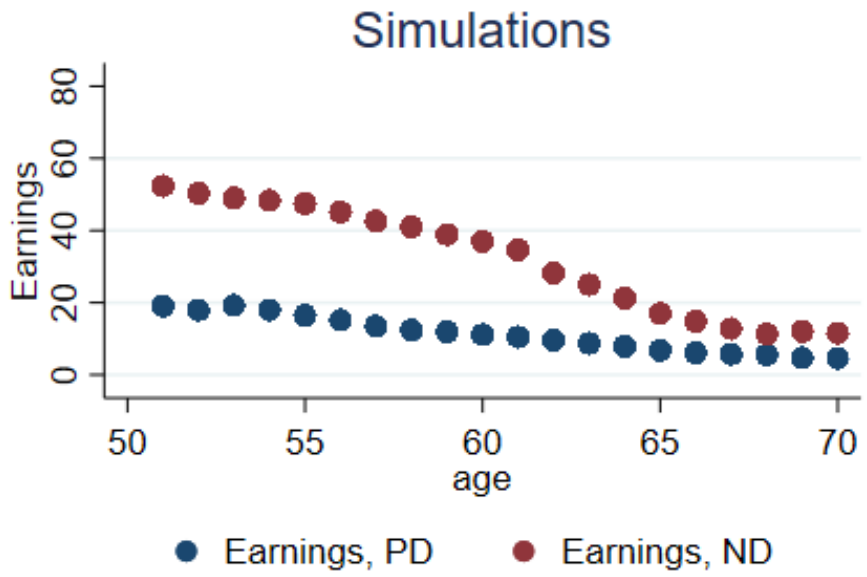

Data
0 .2 .4 .6 .8 1
50 55 60
age
Part. Disabled
Fully Disabled
Not Disabled

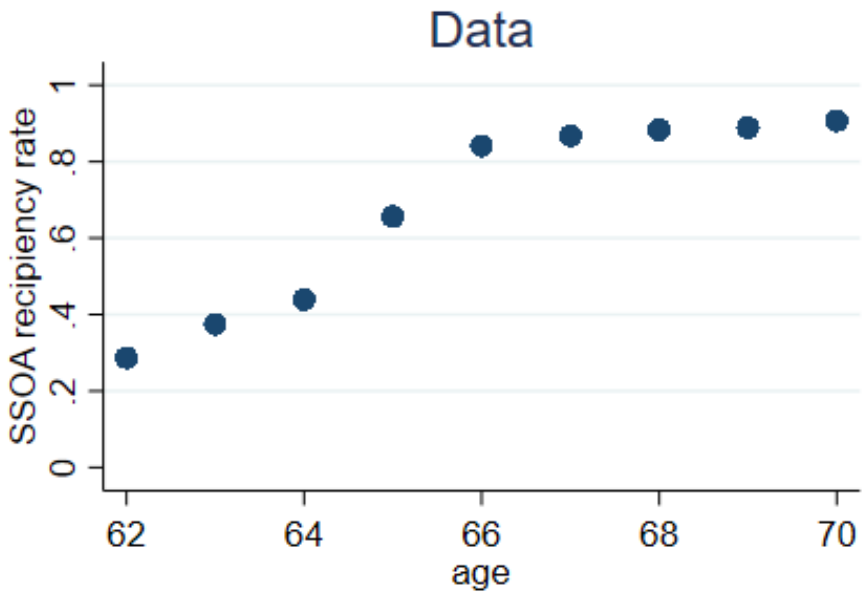

Simulations
0 .2 .4 .6 .8 1
50 55 60
age
Part. Disabled
Fully Disabled
Not Disabled

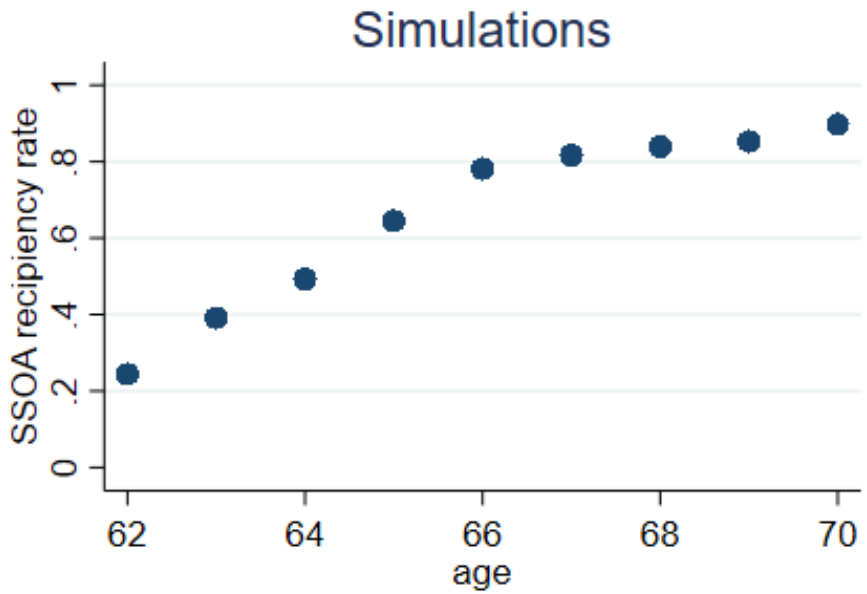

Data
Survival rate
.2 .3 .4 .5 .6 .7 .8 .9 1
50 60 70 80 90
age


Simulations
Survival rate
.2 .3 .4 .5 .6 .7 .8 .9 1
50 60 70 80 90
age


Data
Earnings
0
20
40
60
80
50
55
60
65
70
age
Earnings, PD
Earnings, ND

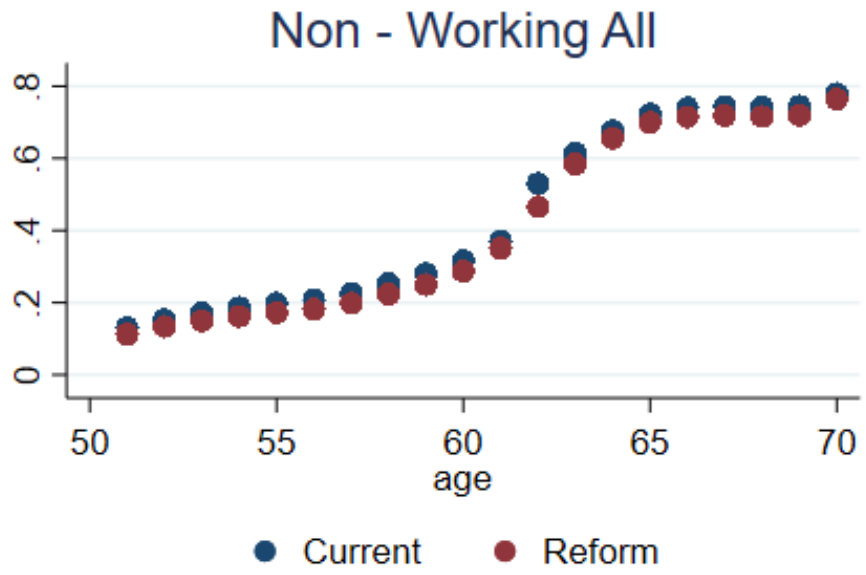

Simulations
Earnings
0
20
40
60
80
50
55
60
65
70
age
Earnings, PD
Earnings, ND

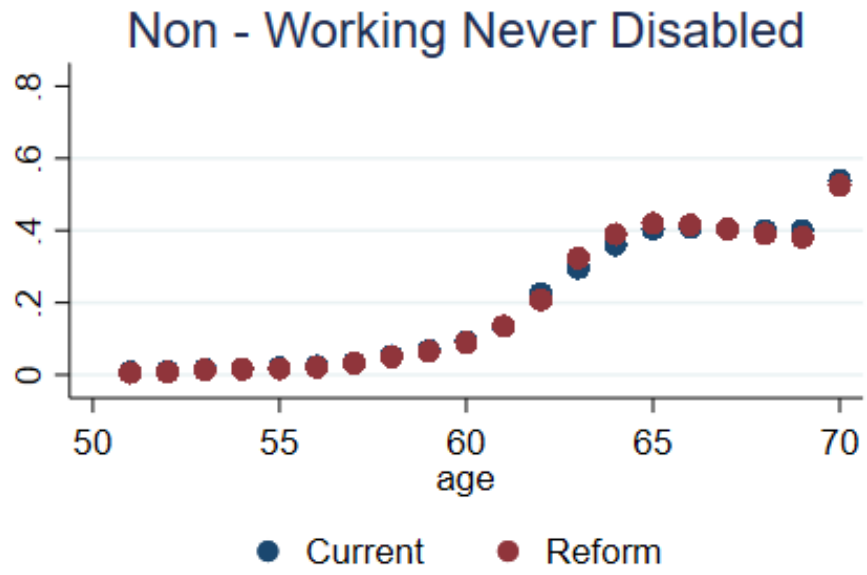

Data
SSOA recipiency rate
0
.2
.4
.6
.8
1
62
64
66
68
70
age

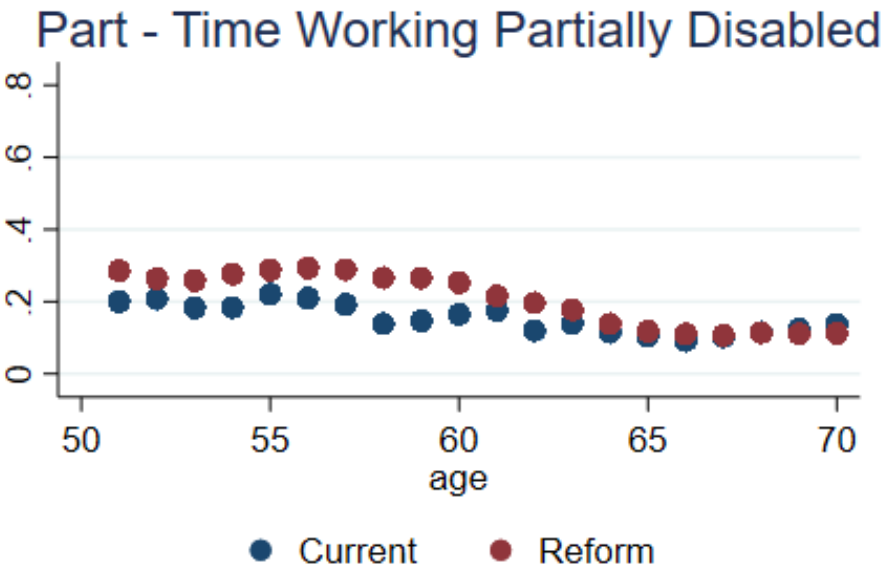

Simulations
SSOA recipiency rate
0
.2
.4
.6
.8
1
62
64
66
68
70
age

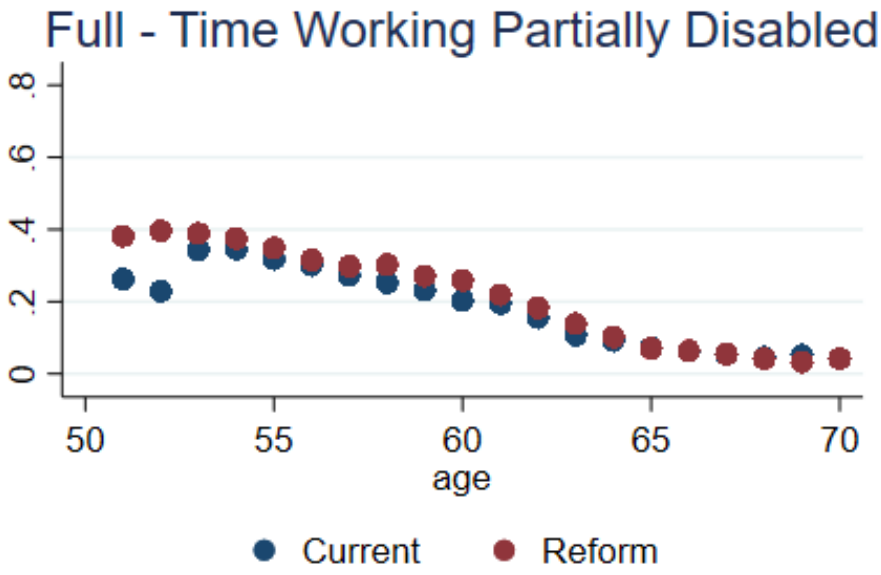
Counterfactual Partial Disability Insurance Reform

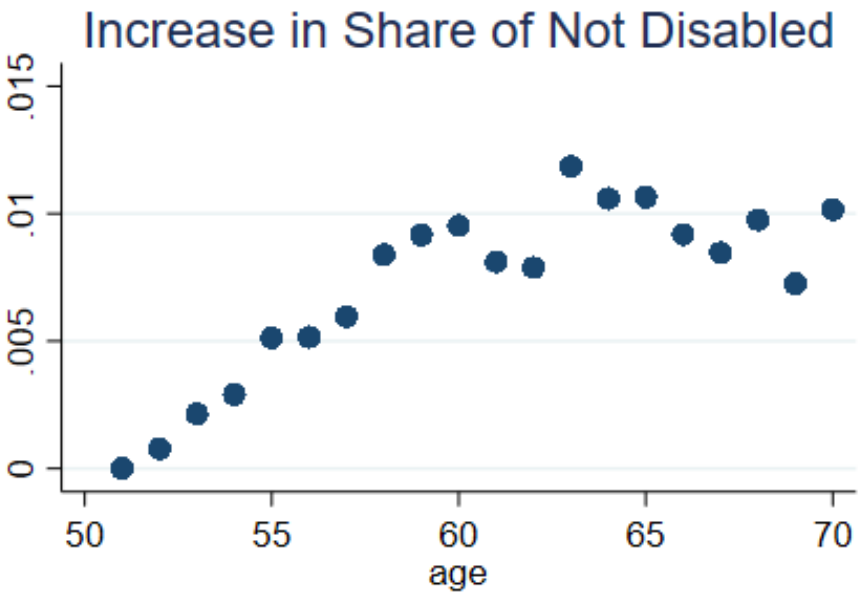
- Those who apply for and those who receive partial DI must continue working (either part-time or full-time)
- If earnings of a partially disabled person are above SGA amount (Substantial Gainful Activity amount, \$1,130/month in 2018), then their benefits are decreased by \$1 for each extra \$1
- Partial DI beneficiaries are not awarded Medicare
- If the partial disability insurance recipients claim they developed full disability and applied for full SSDI benefits, they are granted full SSDI benefits for the period of application

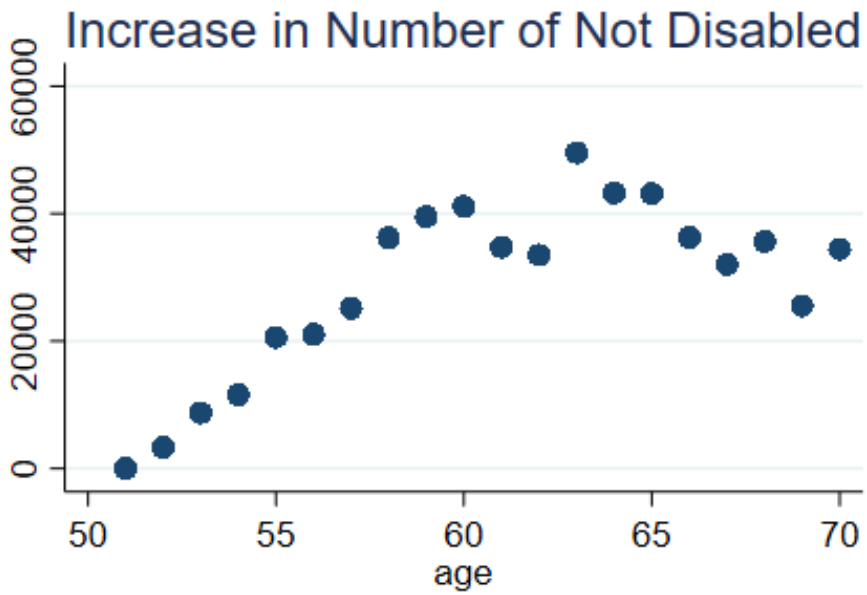

Non - Working All
0
.2
.4
.6
.8
50
55
60
65
70
age
Current
Reform

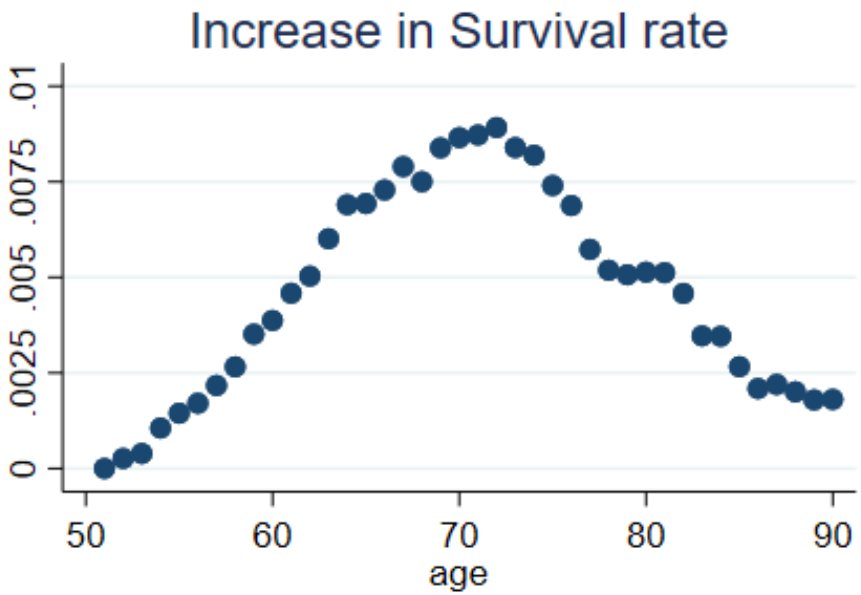

Non - Working Never Disabled
0
.2
.4
.6
.8
50
55
60
65
70
age
Current
Reform

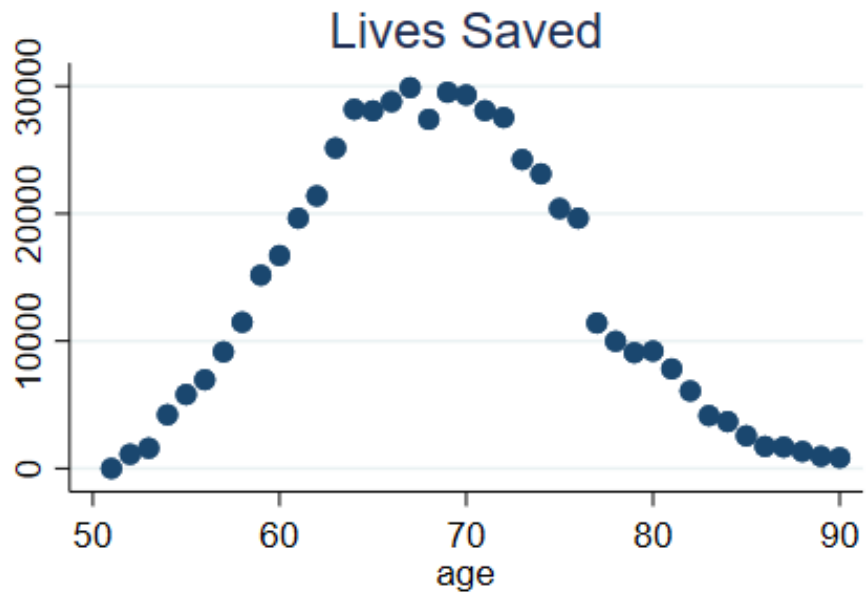

Part - Time Working Partially Disabled
0
.2
.4
.6
.8
50
55
60
65
70
age
Current
Reform

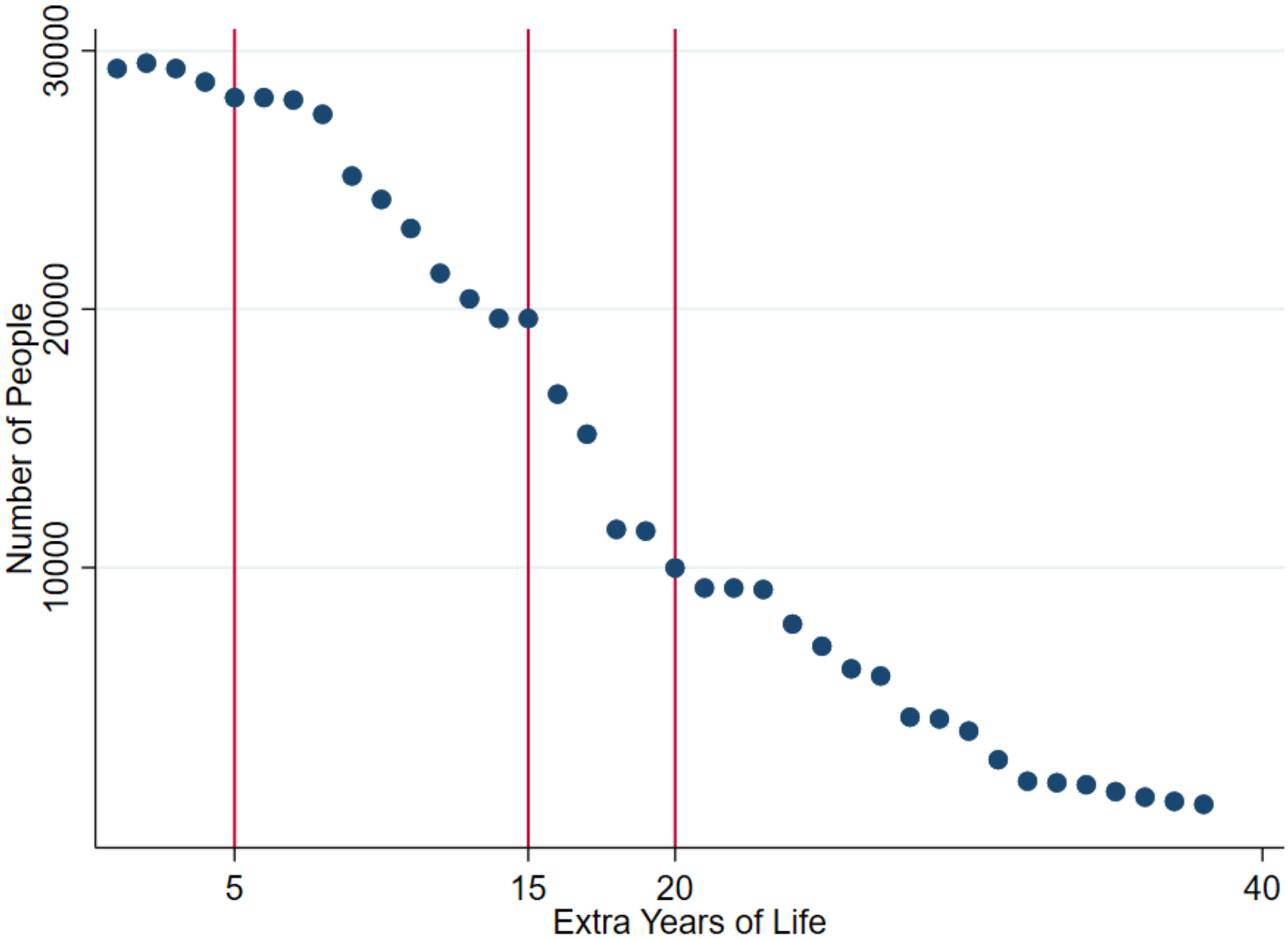

Full - Time Working Partially Disabled
0
.2
.4
.6
.8
50
55
60
65
70
age
Current
Reform


Increase in Share of Not Disabled
0
.005
.01
.015
50
55
60
65
70
age


Increase in Number of Not Disabled
0
20000
40000
60000
50
55
60
65
70
age


Increase in Survival rate
0
.0025
.005
.0075
.01
50
60
70
80
90
age


Lives Saved
0
10000
20000
30000
50
60
70
80
90
age


Number of People
10000
20000
30000
5
15
20
40
Extra Years of Life

Costs and Benefits of 5 Alternatives

Reform	People	Years	Cost per Year
Primary	29,889	553,100	\$17K
\$2 Earned Reduce Benefits By \$1	30,297	558,960	\$20K
Early Medicare	32,492	612,097	\$40K
No Insurance from Full Disability	21,251	352,533	\$3K
Work is not Required	15,962	330,513	\$105K

The value of a life-year is:

- $>$ \$100K for people below 90 (Murphy and Topel, 2006)
- \$120K (Miller et al., 1990)
- \$175K (Moore and Viscusi, 1988)

Partial Disability Insurance Reform Conclusion

The introduction of partial disability insurance (DI) in the US will

- Increase labor supply of partially disabled individuals
  The share of the partially disabled working part-time rises by up to 14 p.p.
- Increase the life span of $\sim 30,000$ people by 5 years, extend lives of $\sim 20,000$ by 15 years, and raise life longevity of $\sim 10,000$ by 20 years
- Decrease the number of disabled Americans by around 1%
- Cost of extending the life of one person by one year is \$17K