The Effect of the Affordable Care Act on the Labor Supply, Savings, and Social Security of Older Americans

Eric French  Hans-Martin von Gaudecker  John Jones

Netspar International Pension Workshop
January 2017
The Effect of the Affordable Care Act on the Labor Supply, Savings, and Social Security of Older Americans
An empirical framework

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Questions

- How will the Affordable Care Act (ACA) affect:

  - out of pocket medical spending?
  - labor supply?
  - savings?
  - welfare?

  and why does it affect medical spending, labor supply, savings, and welfare?
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- and **why** does it affect medical spending, labor supply, savings, and welfare?
Our contribution

- Build upon French and Jones (Econometrica 2011)

- We estimate a retirement model that accounts for:
  - medical expense uncertainty
  - the saving decision
  - multiple insurance possibilities (uninsured, private non-group, employer-provided, Medicaid, Medicare, combinations)

- Then use the model to predict the effects of the ACA and policy proposals that are to come (?)
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Why health insurance affects labor supply

- Some workers delay retirement to maintain employer-provided coverage
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  - Many people will lose the insurance if they leave their job
Why health insurance affects labor supply

- Some workers delay retirement to maintain employer-provided coverage
  - Many people will lose the insurance if they leave their job
  - Private insurance: Difficult to obtain, not tax advantaged, and expensive
Why health insurance affects labor supply

Participation Rates by Health Insurance Type in the Initial Period

- Non-Group
- Retiree
- Tied
Why health insurance affects labor supply

Job Exit Rates by Health Insurance Type in the Initial Period

- Non-Group
- Retiree
- Tied
Why health insurance affects labor supply

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Why the ACA affects labor supply

- The ACA should weaken the link between insurance coverage and work status
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  - Medicaid expansion ⇒ those with very low income receive (largely free) insurance
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- These are the aspects of the law we focus on
  - CBO projects that these are the two main channels by which the insurance rate will change
Roadmap

- The life-cycle model
- HRS and MEPS data
- Health
- Medical expenses and budget sets by insurance type
- Modelling the ACA
Life cycle model

- **Utility**: Consumption, leisure, marital status, bequests

- **Choice variables**: consumption; work hours; Social Security benefit application; health insurance

- **Budget**: $A_{t+1} = A_t + income_t - expenditures_t + transfers_t$
  - $income_t$ includes: labor income; asset income; pension benefits; Social Security benefits. Tax structure modeled in detail.
  - $expenditures_t$ includes: consumption; out of pocket medical expenses and insurance premia.
  - Government/hospital $transfers_t$ provide a “consumption floor” (Hubbard Skinner, Zeldes, 1995), which captures insurance provided via non-payment medical expenses (6% of total)
Data: households with a man aged 50+

- HRS (from 1992-2012)
  - Detailed information on labor supply, wages, health, and assets
  - Confidential data on pensions and Social Security earnings
  - Out-of-pocket medical spending

- MEPS (from 2000-2012)
Data: households with a man aged 50+

- HRS (from 1992-2012)
  - Detailed information on labor supply, wages, health, and assets
  - Confidential data on pensions and Social Security earnings
  - Out-of-pocket medical spending

- MEPS (from 2000-2012)
  - Total billable medical spending
  - Detailed information on who paid for the care
Health

- Not eligible for old-age Medicare: Good, bad, disabled (measured as DI receipt)
Health

- Not eligible for old-age Medicare: Good, bad, disabled (measured as DI receipt)

### Ages 50 → 51

<table>
<thead>
<tr>
<th>Current Year</th>
<th>Disabled</th>
<th>Bad</th>
<th>Good</th>
<th>Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disabled</td>
<td>95.4</td>
<td>0.9</td>
<td>0.5</td>
<td>3.1</td>
</tr>
<tr>
<td>Bad</td>
<td>10.8</td>
<td>64.7</td>
<td>21.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Good</td>
<td>0.3</td>
<td>4.3</td>
<td>94.9</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Not eligible for old-age Medicare: Good, bad, disabled (measured as DI receipt)

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<thead>
<tr>
<th>Current Year</th>
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<th>Good</th>
<th>Deceased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disabled</td>
<td>92.8</td>
<td>1.4</td>
<td>0.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Bad</td>
<td>3.9</td>
<td>72.5</td>
<td>20.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Good</td>
<td>0.5</td>
<td>6.2</td>
<td>92.8</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Health

- Not eligible for old-age Medicare: Good, bad, disabled (measured as DI receipt)
- Eligible for old-age Medicare: Good, bad
### Health

- Not eligible for old-age Medicare: Good, bad, disabled (measured as DI receipt)

- Eligible for old-age Medicare: Good, bad

### Ages 64 → 65

<table>
<thead>
<tr>
<th>Current Year</th>
<th>Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td>Disabled</td>
<td>62.8</td>
</tr>
<tr>
<td>Bad</td>
<td>78.7</td>
</tr>
<tr>
<td>Good</td>
<td>5.8</td>
</tr>
</tbody>
</table>
Health

- Not eligible for old-age Medicare: Good, bad, disabled (measured as DI receipt)
- Eligible for old-age Medicare: Good, bad

### Ages 70 → 71

<table>
<thead>
<tr>
<th>Current Year</th>
<th>Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td>Bad</td>
<td>77.1</td>
</tr>
<tr>
<td>Good</td>
<td>8.6</td>
</tr>
</tbody>
</table>
Health

- Not eligible for old-age Medicare: Good, bad, disabled (measured as DI receipt)

- Eligible for old-age Medicare: Good, bad

<table>
<thead>
<tr>
<th>Current Year</th>
<th>Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td>Bad</td>
<td>73.4</td>
</tr>
<tr>
<td>Good</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Ages 80 → 81
Household total and out-of-pocket medical spending

The mean and variance of total medical spending are functions of health, marital status, and age

\[ \ln Z_t = \mu_z(H_t, SP_t, t) + \sigma_z(H_t, SP_t, t) \times \psi_t \]

\( \psi_t \) has a permanent and a transitory component
Household total medical spending

Mean Medical Expenses, by Health and Marital Status

- **Bad Health & Married**
- **Bad Health & Single**
- **Good Health & Married**
- **Good Health & Single**

2014 dollars

age

- â—¥ Bad Health & Married
- — Bad Health & Single
- ■ Good Health & Married
- —— Good Health & Single
## Household total and out-of-pocket medical spending

<table>
<thead>
<tr>
<th></th>
<th>Younger than 65</th>
<th>65 and Older</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>OOP</td>
</tr>
<tr>
<td>Mean</td>
<td>10,310</td>
<td>1,860</td>
</tr>
<tr>
<td>Median</td>
<td>4,780</td>
<td>1,060</td>
</tr>
<tr>
<td>90\textsuperscript{th} percentile</td>
<td>24,030</td>
<td>4,370</td>
</tr>
<tr>
<td>95\textsuperscript{th} percentile</td>
<td>38,470</td>
<td>6,130</td>
</tr>
</tbody>
</table>
Household total and out-of-pocket medical spending

- The mean and variance of total medical spending are functions of health, marital status, and age

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- Deductibles, co-insurance rates, insurance premia are functions of insurance type, age, participation in the labor market, expected medical expenses, and marital status

\[ M_t = \text{premium}(I_t^+, t, P_t, \hat{Z}_t, SP_t) + \text{copay}(I_t^+, Z_t), \]

\[ \hat{Z}_t = \mathbb{E}[Z_t \mid t, \zeta_{t-1}] \]
Household total and out-of-pocket medical spending

- The mean and variance of total medical spending are functions of health, marital status, and age

\[ \ln Z_t = \mu_z(H_t, SP_t, t) + \sigma_z(H_t, SP_t, t) \times \psi_t \]

\( \psi_t \) has a permanent and a transitory component

- Deductibles, co-insurance rates, insurance premia are functions of insurance type, age, participation in the labor market, expected medical expenses, and marital status

\[
\text{premium} = \begin{cases} 
\text{premium}(t, P_t, SP_t) & \text{if } I_t^+ = \text{retiree} \\
\text{premium}(t, P_t, SP_t) & \text{if } I_t^+ = \text{tied} \\
\text{premium}(\hat{Z}_t, SP_t) & \text{if } I_t^+ = \text{non-group } \cap \text{ priv. plan} \\
0 & \text{if } I_t^+ = \text{non-group } \cap \text{ self-insure}
\end{cases}
\]
Budget sets by health insurance type

![Graph showing budget sets by health insurance type](image-url)
Fraction of uninsured individuals by assets

Fraction of Uninsured by Assets Tercile

Bottom Assets Tercile
Middle Assets Tercile
Top Assets Tercile

Age

52 54 56 58 60 62 64

Fraction of Uninsured if Health Insurance Choice is Possible

Bottom Assets Tercile
Middle Assets Tercile
Top Assets Tercile
### Household medical spending, ages 50-64, by insurance type

<table>
<thead>
<tr>
<th></th>
<th>Uninsured</th>
<th>Medicare</th>
<th>Medicaid</th>
<th>Private non-group</th>
<th>Employer-provided</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total expenses</strong></td>
<td>7,340</td>
<td>17,020</td>
<td>15,360</td>
<td>8,420</td>
<td>10,960</td>
</tr>
<tr>
<td>Out-of-pocket</td>
<td>2,080</td>
<td>2,920</td>
<td>1,040</td>
<td>2,620</td>
<td>1,910</td>
</tr>
<tr>
<td>Pvt insurance</td>
<td>580</td>
<td>850</td>
<td>320</td>
<td>2,730</td>
<td>4,260</td>
</tr>
<tr>
<td>Medicare</td>
<td>970</td>
<td>9310</td>
<td>4,050</td>
<td>840</td>
<td>490</td>
</tr>
<tr>
<td>Medicaid</td>
<td>80</td>
<td>100</td>
<td>6,740</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Other gov’t.</td>
<td>1,110</td>
<td>1,310</td>
<td>470</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td>Other</td>
<td>390</td>
<td>160</td>
<td>240</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td><strong>Out-of-pocket insurance premia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private ins.</td>
<td>450</td>
<td>520</td>
<td>110</td>
<td>5,940</td>
<td>2,800</td>
</tr>
<tr>
<td>Medicare</td>
<td>130</td>
<td>1,160</td>
<td>60</td>
<td>160</td>
<td>100</td>
</tr>
<tr>
<td><strong>Employment rate</strong></td>
<td>0.65</td>
<td>0.08</td>
<td>0.20</td>
<td>0.69</td>
<td>0.84</td>
</tr>
<tr>
<td><strong>Labour income</strong></td>
<td>19,220</td>
<td>2,420</td>
<td>3,900</td>
<td>31,760</td>
<td>43,520</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>9,391</td>
<td>1,719</td>
<td>5,155</td>
<td>2371</td>
<td>33,326</td>
</tr>
</tbody>
</table>
Solution and estimation

- Model is estimated using Method of Simulated Moments
- Method of Simulated Moments estimation is computationally intensive
  - We solve the model on GPUs (using Python and Numba)
  - Implementation is a couple of magnitudes faster than a comparable one on a 100-node cluster
- GPU code sometimes can be hard to debug due to massive parallelization etc.
Reforms we model: Privately purchased insurance

- Insurance policy restrictions
  - Community rating
  - Cap on out-of-pocket expenditures
  - \( \text{expenditures} \geq 0.8 \times \text{premiums} \)
  - Insurer covers \( \geq 70\% \) of expenses (baseline “Silver” policy)

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  - Community rating
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    - expenditures $\geq 0.8 \times$ premiums
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- Deductible and co-pay subsidies
  - For households with income $\leq 250\%$ of FPL
  - As income falls, share of expenses covered by insurer rises
  - Insurers reduce deductibles and co-pays to achieve this
Effect of ACA on OOP expenditures

Out-of-Pocket Expenditures for Selected Non-Group Insurance Policies

OOP Expenditures (000s of 2014 dollars) vs Total Medical Expenditures (000s of 2014 dollars)

- MEPS
- ACA Silver
- ACA: 2.25xFPL
- ACA: 1.75xFPL
- ACA: 1.25xFPL
Reforms we model: Privately purchased insurance

- Premium subsidy
  - for households with income between 100% and 400% of Federal Poverty Level (FPL)
  - upper bound on how much households pay OOP for insurance, rising from 2% of income to 9.5%
  - any premia above the bound covered by government

- Individual mandate
  - uninsured individuals pay tax penalty
  - rises to greater of \{ \$695, 2.5\% \text{ of income} \}
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Reforms we model: Medicaid

► Pre-ACA
  ▶ Households without dependents qualify for Medicaid only via disability
  ▶ Income and (financial) wealth tests

► Post-ACA
  ▶ Any household with income ≤ 138% of FPL qualifies
  ▶ No wealth test
  ▶ Currently, 30 states + DC participate
Wrapping up

- Developed an empirical framework to understand the effect of health insurance reform on out-of-pocket medical spending, labor supply, savings, and welfare on men age 50+.

- Detailed account for Social Security rules, pension plans, tax system, preference heterogeneity, marital status, and insurance plans.

- “Bug-free” estimations started only last week.

- Will allow to predict long term effects of the ACA or other policy proposals.