Mandate-Based Health Reform and the Labor Market: Evidence from the Massachusetts Reform

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ACA and the Massachusetts Reform are Mandate-Based Health Reforms

• 3 Key elements of “Mandate-Based Reform”
  1. Mandate that employers must offer coverage or pay a penalty
  2. Mandate that individuals must have coverage or pay a penalty
  3. Expansions in publicly-subsidized coverage outside of employment
Mandate-based reforms depend critically on relationship between ESHI and the labor market

• Vast majority of nonelderly have employer-sponsored health insurance (ESHI)
  – Half of the increase in coverage in Massachusetts was ESHI
  – CBO predicts 7-8 million newly insured through employer-sponsored health insurance by 2019
We build and estimate a model of mandate-based reform and the labor market

• Develop a simple model of mandate-based health reform
  1. Characterize compensating differential for ESHI
  2. Characterize the welfare impact of mandate-based reform relative to tax-based reform in terms of key “sufficient statistics,” which depend on the compensating differential

• Rely on the Massachusetts reform to estimate the empirical analog of our theoretical model
  1. Estimate the compensating differential for ESHI
  2. Estimate the welfare impact of mandate-based reform relative to counterfactual tax-based reform
Our model extends existing theory of ESHI and the labor market

• Our model extends Summers (1989)
  – Adds empirical content, allowing us to recover all model parameters
    • Cost of ESHI to employers, underlying valuation of ESHI, labor supply and demand elasticities, behavioral responses to individual and employer mandates and subsidies
  – Demonstrates value of capturing policy interactions
    • Employer mandate *increases* distortion if individual mandate already in place
Our findings contribute to empirical lit. on ESHI and the labor market

1. We find a compensating differential for ESHI of the expected theoretical sign and a magnitude ≈ cost of providing ESHI
   - Most estimates of compensating differential from literature are wrong-signed (workers with ESHI also have higher wages)
   - Estimates of expected theoretical sign rely on incremental changes in cost of ESHI
     • Gruber 1994: mandated maternity benefits
     • Baicker and Chandra (2005): increasing malpractice costs
   - Our estimate of the compensating differential reflects the full cost of ESHI to employers

2. We translate our compensating differential into key sufficient statistics for welfare analysis
   - Mandate-based reform is substantially more efficient than it would be if newly-insured did not value new ESHI: 2% of DWL
Outline

I. Massachusetts Reform and the ACA
II. Model of Mandate-Based Health Reform
III. Identification and Estimation
IV. Results
V. Robustness – see paper
VI. Implications for National Reform and Conclusion
Key Provisions of Massachusetts and National Health Reform

Massachusetts Reform, April 2006

- Individual mandate
  - Penalty is up to 50% of basic plan by months without coverage
- Employers mandated to offer coverage
  - >10 FTEs
  - Penalty is $295/worker
- Medicaid expansions
  - Up to 100% of FPL for adults
- Subsidized private plans through exchanges
  - Subsidies up to 300% of FPL

National Reform, March 2010

- Individual mandate
  - Penalty is higher of 2.5% of income or $2,085
- Employers mandated to offer coverage
  - >50 FTEs
  - Penalty is $2,000 per FTE for not offering any insurance
  - Penalty is $3,000 per FTE for not offering affordable coverage, for all employees receiving tax credit (not assessed on first 30 employees)
- Medicaid expansions
  - Up to 133% of FPL
- Subsidized private plans through exchanges
  - Subsidies up to 400% of FPL

Reference: Kaiser Family Foundation
A Model of the Labor Market with Mandate-Based Health Reform

• Alternate approaches to evaluation of policy options for health reform:

<table>
<thead>
<tr>
<th>Reduced form evaluation of health insurance expansion:</th>
<th>Structural model of demand for health insurance, wages and employment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identify a policy experiment (e.g. Massachusetts)</td>
<td>• Model individual’s distributions of health care risk, risk aversion parameters, beliefs about risk, marginal tax rate</td>
</tr>
<tr>
<td>• See what happened to aggregate labor market outcomes and coverage rates</td>
<td>• Estimate why individual does not have coverage and how willing individual would be to gain coverage</td>
</tr>
<tr>
<td>• Requires fewer assumptions and gives clear identification of parameters</td>
<td>• Relate to model of labor market outcomes</td>
</tr>
</tbody>
</table>

• Develop a simple model that nests the full range of structural parameters in “sufficient statistics” that can be measured in labor market outcomes
  – Build on the intuition of Summers (1989) and Gruber and Krueger (1991)
  – Can express policy parameters in the same framework → extend to a general model of mandate-based policy and the labor market
  – Use key, observable parameters in the spirit of Chetty (2009)
Key Provisions of Massachusetts and National Health Reform

**Massachusetts Reform, April 2006**
- **Individual mandate**
  - Penalty is up to 50% of basic plan by months without coverage
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Reference: Kaiser Family Foundation
The Model

• Build on the basic framework of Summers (1989) and Gruber and Krueger (1991)

• Key features of the model and mandate-based health reform
  – Cost of a standardized health benefit: $b$
  – Individual’s valuation of the benefit: $\alpha \geq 0$
  – Individual penalty for non-compliance (individual mandate): $\lambda_t \in (0,1)$
  – Employer penalty for non-compliance (employer mandate): $\rho_t \in (0,1)$
  – Subsidy level: $\mu_{xt} \in (0,1)$

• Labor market equilibrium:
  – Labor demand:
    \[
    L^t_D = L^{ESH}_D(w + b) ESHI_t + L^{NoESH}_D(w + \rho_t b)(1 - ESHI_t) \]
  – Labor supply:
    \[
    L^t_S = L^{ESH}_S(w + \alpha b + \lambda_t b - \mu_{xt} b) ESHI_t + L^{NoESH}_S(w)(1 - ESHI_t) \]
We can use the model to characterize

1. Compensating differential for ESHI

\[
\frac{(1 - \rho_t)s - (\alpha + \lambda_t - \mu_{xt})}{d - s} b
\]

• Hours differential for ESHI

\[
\frac{1 - \rho_t - (\alpha + \lambda_t - \mu_{xt})}{d - s} b
\]

2. Sufficient statistics for welfare impact of mandate-based reform

\[
DWL_m = \frac{b^2}{s(s - d)} (1 - (\alpha + \lambda_{\text{After}} - \mu_{x,\text{After}}))^2 ESHI_{\text{After}} - \rho^2_{\text{After}} (1 - ESHI_{\text{After}})
\]

• Welfare impact relative to tax-based reform

\[
\frac{DWL_m}{DWL_t} = \frac{b^2}{\tau^2} (1 - (\alpha + \lambda_{\text{After}} - \mu_{x,\text{After}}))^2 ESHI_{\text{After}} - \rho^2_{\text{After}} (1 - ESHI_{\text{After}})
\]
Graphical Representation

• Allows us to visualize the compensating and hours differentials for ESHI and the welfare impact of mandate-based reform relative to tax-based reform

• We build up the graphical representation with one policy at a time
  – Tax
  – Employer Mandate (full-compliance, pay-or-play)
  – Individual Mandate (pay-or-play) and subsidies
Graphical Model – No Employer-Sponsored Health Ins (ESHI)
Employer Tax to Finance Health Insurance

\[ W_{NoESHI, Before}, \tau = b, L_{NoESHI, Before} \]

Before No ESHI, After No ESHI, w

T, A, L'

Employer Tax to Finance Health Insurance

\[ W_{NoESHI, After}, \tau = b, L_{NoESHI, After} \]
Employer Tax to Finance Health Insurance

\[ A \]
Full-Compliance Employer Mandate Mandate Summers (1989)

D’W’L if ESHI,After=1: D’AD’
D’W’L if ESHI,After=0: not possible

Employer mandate decreases DWL!
Pay-or-Play Employer Mandate

\[ w_{\text{NoESHI, Before}} \]

\[ w_{\text{ESHI, t}} \]

\[ w_{\text{NoESHI, After}} \]

\[ W \]

\[ L_{\text{ESHI, t}} \]

\[ L_{\text{NoESHI, t}} \]

\[ L_{\text{NoESHI, After}} \]

\[ L_{\text{NoESHI, Before}} \]

\[ L_{S}^{\text{ESHI, Before}} \]

\[ L_{D}^{\text{ESHI, Before}} \]

\[ L_{D}^{\text{NoESHI, Before}} \]

\[ L_{D}^{\text{NoESHI, After}} \]

DWL if ESHI, After = 1: D’’AD’
DWL if ESHI, After = 0: BAB’
Pay-or-Play Individual Mandate Only

Before ESHI, $L_{EHI},L$, $w$, $W_{EHI},W_{ESHI},W_{NoESHI},w$

After ESHI, $L_{EHI},L$, $w$, $W_{EHI},W_{ESHI},W_{NoESHI},w$

DWL if ESHI, $After=1$: $F''AF'$
DWL if ESHI, $After=0$: 0

Pay-or-Play
Individual Mandate Only

- DWL if ESHI, After=1: $F''AF'$
- DWL if ESHI, After=0: 0
Pay-or-Play Employer Mandate
And Pay-or-Play Individual Mandate

DWL if ESHI,After=1: F’’AF’
DWL if ESHI,After=0: BAB’

Employer mandate increases DWL!
Key to Identification:
Differences Between Labor Market Equilibria

- Express compensating and hours in terms of wages (w) and hours (L)
  - Preferred compensating differential: \( w_F - w_A \)
  - Preferred hours differential: \( L_F - L_A \)

- Express all sufficient statistics in terms of wages (w) and hours (L)
  - Cost of ESHI to employers
    \[ b = d(L_F - L_A) - (w_F - w_A) \]
  - Penalty-and-subsidy-inclusive valuation of ESHI
    \[ \alpha + \lambda - \mu_x = \frac{s(L_F - L_A) - (w_F - w_A)}{b} \]
Taking the Model to MA

• Minimum needed for identification
  – 8 data points from within MA
    • ESHI, NoESHI and After, Before for w, L

• Add more variation to identify parameters more convincingly
  – MA vs. Non-MA
  – Within individual over time
  – Small (exempt) firms vs. large firms – preferred specification

• Add more variation to identify more parameters
  – Different subsidy amounts based on eligibility
    • Separately identify individual penalty from subsidy
    • Separately identify behavioral responses to different subsidy amounts for different eligibility categories
Estimation
Wage and Hours Equations

\[ Y_{it} = \left[ \beta_1 MA \times ESHI \times After \times Large + \beta_8 MA \times ESHI \times Large + \beta_{11} MA \times After \times Large + \right. \\
\beta_{12} ESHI \times After \times Large + \beta_{19} ESHI \times Large + \beta_{22} After \times Large + \\
\beta_{23} Large + \phi_g \times Large + \right] \\
\beta_{1[e]} MA \times ESHI \times After + \beta_{8[e]} MA \times ESHI + \beta_{11[e]} MA \times After + \\
\beta_{12[e]} ESHI \times After + \beta_{19[e]} ESHI + \beta_{22[e]} After + \phi_s + \delta_i + \varepsilon_{it} \]

Estimate separate equations for w and L

- Baseline – no firm size interactions (bracketed)
- Preferred – firm size interactions
Data

• Survey of Income and Program Participation (SIPP)
  – Longitudinal data from January 2004-December 2007
    • 2004: 72,057 unique individuals, 2,047 in MA
    • 2007: 28,661 unique individuals, 685 in MA
  – Includes health insurance coverage
  – Issues of seam bias and alternate panel weights

• Also examine restricted-use MEPS, but don’t have enough sample size (only 15% size of SIPP)
Preliminary Evidence on Compensating Differential: Wage Premium for ESHI vs. No ESHI

Wages lower ~ $2.15/hour (10%) in MA with ESHI After

Regression coefficients with w as dependent variable. See text for details.

Wages and ESHI are two-month indicators. May-June 2006 are normalized to zero.
Graphical Depiction of Preferred Estimates

\[ L_{ESHI, After} = (\alpha + \lambda - \mu) b \]

\[ L_{NoESHI, Before} \]

\[ L_{NoESHI, After} \]

\[ L_{S_{ESHI, After}} \]

\[ L_{D_{ESHI, After}} \]

\[ L_{S_{NoESHI, t}} \]

\[ L_{D_{NoESHI, Before}} \]

\[ L_{D_{NoESHI, After}} \]
Results

• Compensating Differential
  – $5,350 per year
  – Substantial fraction of $6,105 from KFF – preview that valuation will be high

• Welfare Impact
  – Penalty-and-subsidy-inclusive valuation
    • 84%
  – DWL
    • $8 per year per full-time worker
    • 2% of DWL from tax
Implications for National Reform

• ACA has higher employer penalty $\rho$
  – Penalty of $3,000/employee (46\% \text{ of } b)$ increases DWL ratio to 10.8%

• ACA has higher individual penalty $\lambda$
  – Decreases distortion relative to MA

• ACA has smaller subsidies
  – Decreases distortion relative to MA

• ACA extends subsidies to more people
  – Increases distortion relative to MA
Conclusion I: We extend existing theory of ESHI and the labor market

• Our model extends Summers (1989)
  – Adds empirical content, allowing us to recover all model parameters
    • Cost of ESHI to employers, underlying valuation of ESHI, labor supply and demand elasticities, behavioral responses to individual and employer mandates and subsidies
  – Demonstrates value of capturing policy interactions
    • Employer mandate *increases* distortion if individual mandate already in place
Conclusion II: We find compensating differential for full cost of ESHI

- We find a compensating differential for ESHI of the expected theoretical sign and a magnitude ≈ cost of providing ESHI
  - Most estimates of compensating differential from literature are wrong-signed (workers with ESHI also have higher wages)
  - Estimates of expected theoretical sign rely on incremental changes in cost of ESHI
    - Gruber 1994: mandated maternity benefits
    - Baicker and Chandra (2005): increasing malpractice costs
  - Our estimate of the compensating differential reflects the full cost of ESHI to employers
Conclusion III: We find DWL lower under mandate-based reform relative to tax-based reform

- We translate our compensating differential into key sufficient statistics for welfare analysis
  - Mandate-based reform is substantially more efficient than alternative tax-based reform: 2% of DWL
  - This result is robust
Broader Research Agenda on Massachusetts & National Reforms

- Hospital and preventive care (JPubEc, 2012)
- Welfare cost of adverse selection (NBER WP)
Extra Slides
Pay-or-Play Employer Mandate
And Pay-or-Play Individual Mandate And Subsidy

DWL if ESHI, After=1: E’’AE’'
DWL if ESHI, After=0: BAB’
Much Discussion with Little (but growing) Evidence

The Massachusetts Health-Care 'Train Wreck'

The future of ObamaCare is unfolding here: runaway spending, price controls, even licensing.

By JOSEPH RAGO

President Obama said earlier this year that the health-care bill that Congress passed is "essentially identical" to the Massachusetts universal coverage plan that then-Gov. Mi in 2006. No one but Mr. Romney disagrees.

The New York Times

April 21, 2010

EDITORIAL

Reform and Massachusetts

Four years after Massachusetts enacted its ambitious health care reform, the state has achieved its goal: covering most of the uninsured without seriously straining its budget. Most citizens seem to like it.
Evidence on the labor market?

OBAMACARE: A BUDGET-BUSTING, JOB-KILLING HEALTH CARE LAW

A REPORT ON THE ECONOMIC AND FISCAL CONSEQUENCES OF THE PATIENT PROTECTION AND AFFORDABLE CARE ACT
(PUBLIC LAW 111-148)
&
THE HEALTH CARE AND EDUCATION RECONCILIATION ACT
(PUBLIC LAW 111-552)

Rep. John Boehner (R-OH), Speaker of the House
Rep. Eric Cantor (R-VA), House Majority Leader
Rep. Dave Camp (R-MI), Chairman, Committee on Ways & Means
Rep. John Kline (R-MN), Chairman, Committee on Education & the Workforce
Rep. Paul Ryan (R-WI), Chairman, Committee on the Budget
Rep. Fred Upton (R-MI), Chairman, Committee on Energy & Commerce

JANUARY 6, 2011
### Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>Full Population</th>
<th>MA</th>
<th>Non-MA</th>
<th>MA-Non-MA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>w: Weekly earnings / baseline hours per week</strong></td>
<td>Before</td>
<td>After</td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>20.75</td>
<td>22.36</td>
<td>25.36</td>
<td>26.94</td>
<td>20.64</td>
</tr>
<tr>
<td>2.77</td>
<td>2.84</td>
<td>2.96</td>
<td>3.03</td>
<td>2.76</td>
</tr>
<tr>
<td>29.23</td>
<td>28.80</td>
<td>30.19</td>
<td>31.05</td>
<td>29.21</td>
</tr>
<tr>
<td>39.05</td>
<td>38.85</td>
<td>38.27</td>
<td>37.82</td>
<td>39.07</td>
</tr>
<tr>
<td>3.61</td>
<td>3.61</td>
<td>3.57</td>
<td>3.56</td>
<td>3.61</td>
</tr>
<tr>
<td><strong>Hours per week in all jobs</strong></td>
<td>41.24</td>
<td>40.93</td>
<td>40.63</td>
<td>39.48</td>
</tr>
<tr>
<td><strong>Paid job</strong></td>
<td>0.78</td>
<td>0.78</td>
<td>0.82</td>
<td>0.84</td>
</tr>
<tr>
<td><strong>Employed by Large Firm</strong></td>
<td>0.85</td>
<td>0.84</td>
<td>0.86</td>
<td>0.82</td>
</tr>
<tr>
<td><strong>Any Health Insurance</strong></td>
<td>0.83</td>
<td>0.84</td>
<td>0.90</td>
<td>0.95</td>
</tr>
<tr>
<td><strong>ESHI</strong></td>
<td>0.66</td>
<td>0.65</td>
<td>0.74</td>
<td>0.74</td>
</tr>
<tr>
<td><strong>&lt;150%FPL†</strong></td>
<td>0.13</td>
<td>0.11</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td><strong>150-300%FPL†</strong></td>
<td>0.19</td>
<td>0.16</td>
<td>0.14</td>
<td>0.09</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>40.01</td>
<td>40.27</td>
<td>40.50</td>
<td>40.79</td>
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<tr>
<td><strong>Married</strong></td>
<td>0.56</td>
<td>0.55</td>
<td>0.54</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>0.51</td>
<td>0.51</td>
<td>0.51</td>
<td>0.52</td>
</tr>
</tbody>
</table>

†FPL category defined for each individual based on status in the Jan-June 2006 period.
2004 SIPP Panel. Monthly weights used.
Full 18-64 population. Only includes interview months.
MA-Non-MA After-Before is the coefficient on MA*After from a regression of the outcome on MA*After, MA, and After.
***p<0.01, **p<0.05, *p<0.1, block bootstrapped by state.
w and L measures include individuals without a paid job with w=0 or L=0, respectively, unless noted otherwise.

- 3.6% of sample gains health insurance relative to non-MA
- Model predicts w and L decrease for people who change ESHI status
- In aggregate labor market, expect no or small neg. change, but w and L increase
- Suggests that we need to control for MA-specific factors after reform
Weekly earnings / baseline hours per week, including without paid job \((\text{wage}=0)\). Full 18-64 population. Monthly weights are used to calculate means.
Log Wage Trends in MA vs. Non-MA

Log (weekly earnings / baseline hours per week | paid job & weekly earnings > 0). Full 18-64 population. Monthly weights are used to calculate means.
All Sufficient Statistics are Differences Between Labor Market Equilibria

<table>
<thead>
<tr>
<th>Sufficient statistics</th>
<th>Wages and Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>$s$</td>
<td>$\frac{w_B-w_A}{L_B-L_A}$</td>
</tr>
<tr>
<td>$d$</td>
<td>$\frac{w_F-w_D}{L_F-L_D}$</td>
</tr>
<tr>
<td>$\rho$</td>
<td>$\frac{d(L_B-L_A)-(w_B-w_A)}{b}$</td>
</tr>
<tr>
<td>$b$</td>
<td>$d(L_F-L_A)-(w_F-w_A)$</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>$\frac{s(L_D-L_A)-(w_D-w_A)}{b}$</td>
</tr>
<tr>
<td>$\lambda - \mu_x$</td>
<td>$\frac{s(L_F-L_D)-(w_F-w_D)}{b}$</td>
</tr>
<tr>
<td>$\alpha + \lambda - \mu_x$</td>
<td>$\frac{s(L_F-L_A)-(w_F-w_A)}{b}$</td>
</tr>
</tbody>
</table>
## Compensating and Hours Differentials In Terms of Coefficients

### Table 1: Compensating and Hours Differentials

<table>
<thead>
<tr>
<th>Compensating Differential</th>
<th>$t$</th>
<th>Sufficient Statistics</th>
<th>Coefficients</th>
</tr>
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<tbody>
<tr>
<td>$w_D - w_A$</td>
<td>Before - Before</td>
<td>$\frac{s-\alpha d}{d-s} b$</td>
<td>$\beta_8 \left[ + \beta_{8e} \right]$</td>
</tr>
<tr>
<td>$w_F - w_B$</td>
<td>After - After</td>
<td>$\frac{(1-\rho)s-(\alpha+\lambda-\mu_x)d}{d-s} b$</td>
<td>$\beta_1 + \beta_8 \left[ + \beta_{1e} + \beta_{8e} \right]$</td>
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<td>$w_D - w_B$</td>
<td>Before - After</td>
<td>$\frac{(1-\rho)s-\alpha d}{d-s} b$</td>
<td>$\beta_8 - \beta_{11} \left[ + \beta_{8e} \right]$</td>
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<td>$w_F - w_A$</td>
<td>After - Before</td>
<td>$\frac{s-\alpha+\lambda-\mu_x d}{d-s} b$</td>
<td>$\beta_1 + \beta_8 + \beta_{11} \left[ + \beta_{1e} + \beta_{8e} \right]$</td>
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<thead>
<tr>
<th>Hours Differential</th>
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<tbody>
<tr>
<td>$L_D - L_A$</td>
<td>Before - Before</td>
<td>$\frac{1-\alpha}{d-s} b$</td>
<td>$\gamma_8 \left[ + \gamma_{8e} \right]$</td>
</tr>
<tr>
<td>$L_F - L_B$</td>
<td>After - After</td>
<td>$\frac{1-\rho-(\alpha+\lambda-\mu_x)}{d-s} b$</td>
<td>$\gamma_1 + \gamma_8 \left[ + \gamma_{1e} + \gamma_{8e} \right]$</td>
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Sufficient Statistics
In Terms of Coefficients

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<td>$\beta_{11}$</td>
</tr>
<tr>
<td>$d$</td>
<td>$\frac{w_F-w_D}{L_F-L_D}$</td>
<td>$\frac{\beta_1+\beta_{11}+\beta_{1e}}{\gamma_{11}+\gamma_{11}+\gamma_{1e}}$</td>
</tr>
<tr>
<td>$\rho$</td>
<td>$\frac{d(L_B-L_A)-(w_B-w_A)}{b}$</td>
<td>$\frac{d(\gamma_{11})}{(\beta_{11})}$</td>
</tr>
<tr>
<td>$b$</td>
<td>$d(L_F-L_A)-(w_F-w_A)$</td>
<td>$d(\gamma_{1}+\gamma_{8}+\gamma_{11}+\gamma_{1e}+\gamma_{8e})-(\beta_1+\beta_{8}+\beta_{11}+\beta_{1e}+\beta_{8e})$</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>$\frac{s(L_D-L_A)-(w_D-w_A)}{b}$</td>
<td>$\frac{s(\gamma_{8}+\gamma_{8e})}{(\beta_{8}+\beta_{8e})}$</td>
</tr>
<tr>
<td>$\lambda - \mu_x$</td>
<td>$\frac{s(L_F-L_D)-(w_F-w_D)}{b}$</td>
<td>$\frac{s(\gamma_{1}+\gamma_{11}+\gamma_{1e})}{(\beta_1+\beta_{11}+\beta_{1e})}$</td>
</tr>
<tr>
<td>$\alpha + \lambda - \mu_x$</td>
<td>$\frac{s(L_F-L_A)-(w_F-w_A)}{b}$</td>
<td>$\frac{s(\gamma_{1}+\gamma_{8}+\gamma_{11}+\gamma_{1e}+\gamma_{8e})}{(\beta_1+\beta_{8}+\beta_{11}+\beta_{1e}+\beta_{8e})}$</td>
</tr>
</tbody>
</table>
Express Equilibria in Terms of Coefficients

Table 3: Wages in Terms of Coefficients

<table>
<thead>
<tr>
<th>$w_{A}$</th>
<th>NoESH1, Before</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>$w_{B}$</td>
<td>NoESH1, After</td>
<td>$\beta_{11}$</td>
</tr>
<tr>
<td>$w_{D}$</td>
<td>ESH1, Before</td>
<td>$\beta_{8} \left[ + \beta_{8e} \right]$</td>
</tr>
<tr>
<td>$w_{F}$</td>
<td>ESH1, After</td>
<td>$\beta_{1} + \beta_{8} + \beta_{11} \left[ + \beta_{1e} + \beta_{8e} \right]$</td>
</tr>
</tbody>
</table>

Hours in Terms of Coefficients: replace $\beta$ with $\gamma$
Welfare Impact of Health Reform

\[ DWL_m = \frac{\hat{b}^2}{2(\hat{s} - \hat{d})} (1-(\alpha + \lambda - \mu_x))^2 ESHI_{After} + \hat{\rho}^2 (1-ESHI_{After}) \]

\[ \frac{DWL_m}{DWL_{\tau}} = \left( \frac{\hat{b}}{\tau} \right)^2 (1-(\alpha + \lambda - \mu_x))^2 ESHI_{After} + \hat{\rho}^2 (1-ESHI_{After}) \]

• Where identification does not come from changes induced by the MA reform, we calibrate values
Accounting for Relationship Between Penalty and Valuation

- Simple model adds underlying valuation and penalty in valuation
- More realistically, higher valuations are associated with lower impact of the penalty
  - People who already have health insurance because they value it are not impacted by penalty
- Model the statutory penalty flexibly to account for interaction:

\[
\lambda = \begin{cases} 
\Lambda, & \text{for } \alpha \leq 1 - \Lambda \\
1, & \text{for } 1 - \Lambda \leq \alpha \leq 1 \\
0, & \text{for } \alpha > 1
\end{cases}
\]
Key Question for Supreme Court: Is the individual mandate penalty a tax?

JUSTICE ALITO: General Verrilli, today you are arguing that the penalty is not a tax. Tomorrow you are going to be back and you will be arguing that the penalty is a tax.
We inform the economics of a mandate penalty vs. a tax
Compensating Differential

\[ (\lambda - \mu_x) b \]

\[ \rho b \]

\[ b \]
Before No ESHI L,

After No ESHI L,

Before ESHI S,

After ESHI S,

Before No ESHI D,

After No ESHI D,

Before ESHI w,

After ESHI w,

Cost of ESHI to Employers $b$

$DWL$ of tax-based reform proportional to $b^2$
Cost of ESHI to Employers $b$

$DWL$ of mandate-based reform for ESHI, After = 1 proportional to $(1-(\alpha + \lambda - \mu_x))^2$
Robustness to Calibrated Values

• Compensating and hours differentials do not reflect calibrated values
  – 95% CI for compensating differential (-$7,956, -$3,122)
• Efficiency of mandate-based relative to tax-based health reform (DWL ratio = 2%) reflects calibration
  – 95% CI for DWL ratio (0.2% to 10.1%) is smaller than actual
  – Increase employer penalty $\rho$ from $295$ (4.9% of $b$) to $25\%$ of $b$, DWL ratio = 7%
  – Increase $b/\tau$ from 1 to 1.1, DWL ratio = 6.5%, increase $b/\tau$ to 1.5 (gov. has 50% loading), DWL ratio = 12%
  – Increase supply elasticity from 0.1 to .2, DWL ratio=9.5%
  – Decrease demand elast. from -0.2 to -0.4, DWL ratio=10.6%
Robustness to Estimation Sample

• Allow underlying valuation $\alpha$ to vary across individuals
  – Can examine incidence across employee groups in model with heterogeneity
  – Test of robustness in true model

• Restrict estimation sample to different groups
  – New England only
    • Larger compensating and hours differentials, penalty-and-subsidy-inclusive valuation: 0.77, DWL ratio: 3.8%
  – Married people only (different valuation?)
    • Penalty-and-subsidy-inclusive valuation: 0.71
Robustness to Intensive Margin Only

• Fixed cost of ESHI may favor hours margin over employment margin (Cutler and Madrian, 1998)
  – Baseline specification allows for an effect on both
• Restrict sample only to workers
  1. Paid job & w>0 in given period
  2. Paid job & w>0 in entire SIPP
  3. Paid job & w>0 & same job in entire SIPP
     → Can estimate levels and logs specifications
• Still observe compensating differential in all specifications, DWL ratio from 4.6% to 18.4%
• Suggests that extensive margin decision of whether to work and job switches do not drive our results
# Diff-in-Diff Coverage Impact from CPS

<table>
<thead>
<tr>
<th></th>
<th>(1) Uninsured</th>
<th>(2) ESHI</th>
<th>(4) Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MA*After</strong></td>
<td>-0.0571</td>
<td>0.0345</td>
<td>0.0351</td>
</tr>
<tr>
<td></td>
<td>[-0.0605, -0.0537]***</td>
<td>[0.0283, 0.0408]***</td>
<td>[0.0317, 0.0386]***</td>
</tr>
<tr>
<td><strong>During*MA</strong></td>
<td>-0.0049</td>
<td>0.0024</td>
<td>-0.0005</td>
</tr>
<tr>
<td></td>
<td>[-0.0093, -0.0005]**</td>
<td>[-0.0016, 0.0064]</td>
<td>[-0.0036, 0.0025]</td>
</tr>
<tr>
<td><strong>N (Nonelderly)</strong></td>
<td>1,129,221</td>
<td>1,129,221</td>
<td>1,129,221</td>
</tr>
<tr>
<td><strong>R Squared</strong></td>
<td>0.0152</td>
<td>0.0160</td>
<td>0.0071</td>
</tr>
<tr>
<td><strong>MA Before</strong></td>
<td>0.1176</td>
<td>0.7044</td>
<td>0.1113</td>
</tr>
<tr>
<td><strong>Non-MA Before</strong></td>
<td>0.1732</td>
<td>0.6358</td>
<td>0.1066</td>
</tr>
<tr>
<td><strong>MA After</strong></td>
<td>0.0612</td>
<td>0.7255</td>
<td>0.1565</td>
</tr>
<tr>
<td><strong>Non-MA After</strong></td>
<td>0.1747</td>
<td>0.6214</td>
<td>0.1167</td>
</tr>
</tbody>
</table>

95% asymptotic CI clustered by state shown, followed by 95% CI obtained through block bootstrap by state, 1000 reps.

- Significant decline in uninsurance
  - 49% reduction relative to MA pre-reform
- Magnitude of increase after reform was similar for ESHI and Medicaid coverage
Massachusetts Reform, A Model for National Reform

• “...the fact of the matter is, we used the same advisers, and they say it’s the same plan.”

- President Obama,
First Presidential Debate 2012
CPS: Coverage Increased in MA
Half of New Coverage was ESHI
Recall Theoretical Graph

\[ (\lambda - \mu_x)b \]
Log Wage Premium for ESHI vs. No ESHI

Regression coefficients with w as dependent variable. See text for details. Wages and ESHI are two-month indicators. May-June 2006 are normalized to zero.
Estimated Compensating and Hours Differentials

\[ w_F - w_A = -2.572^{***} \]
\[ L_F - L_A = -0.831^* \]

Annualized compensating differential: \(-2.572 \times 40 \times 52 = -5,350\)
Substantial fraction of $6,105 from KFF – valuation will be high
Estimated Sufficient Statistics
And Welfare Impact of Health Reform

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>$s$</td>
<td>0.190</td>
<td>-</td>
</tr>
<tr>
<td>$d$</td>
<td>-0.380</td>
<td>-</td>
</tr>
<tr>
<td>$\rho$</td>
<td>0.049*** [0.032, 0.081]</td>
<td>-</td>
</tr>
<tr>
<td>$b$</td>
<td>2.888*** [1.760, 4.467]</td>
<td>-</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>-0.718*** [-1.339, -0.452]</td>
<td>1.554*** [1.204, 2.201]</td>
</tr>
<tr>
<td>$\lambda - \mu_x$</td>
<td>1.554*** [1.204, 2.201]</td>
<td>0.836*** [0.631, 1.001]</td>
</tr>
<tr>
<td>$a + \lambda - \mu_x$</td>
<td>0.836*** [0.631, 1.001]</td>
<td>-</td>
</tr>
<tr>
<td>$\text{ESHIAfter}$</td>
<td>0.740</td>
<td>-</td>
</tr>
<tr>
<td>$\frac{b}{\tau}$</td>
<td>1.000</td>
<td>-</td>
</tr>
<tr>
<td>$\text{DWL}_m$</td>
<td>0.150*** [0.007, 1.076]</td>
<td>-</td>
</tr>
<tr>
<td>$\text{DWL}<em>m / \text{DWL}</em>\tau$</td>
<td>0.021*** [0.002, 0.101]</td>
<td>-</td>
</tr>
</tbody>
</table>

Penalty-and-subsidy-inclusive valuation: 84%

Annualized cost of ESHI b: $6,007

Annualized $\text{DWL}_m$: $8 per year per full-time worker, 2% $\text{DWL}_\tau$
Preliminary Evidence on the Compensating Differential

• Figure assumes no employer penalty (~ 0 because ρ small), therefore, NoESHI, After is an additional control group
  – Recall that model predicts that ESHI wages will fall (individual penalty-and-inclusive valuation) AND NoESHI wages will fall (employer penalty) in MA after reform
• Figure shows ESHI wages lower than NoESHI wages by approximately 10% or $2.13/hour ($4,435 annually for full-time)
• KFF Survey from 2007 suggests average premium of $4,355 and $11,770 for individual and families, respectively
  – Weighting by family structure and employer share in the SIPP gives $6,105 on average
• First evidence for relatively high valuations of ESHI among those impacted by reform