Lobbying and Legislative Uncertainty

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3. Ultimately, want to identify cross-industry measures of legislative uncertainty
   - but for today, unidimensional model

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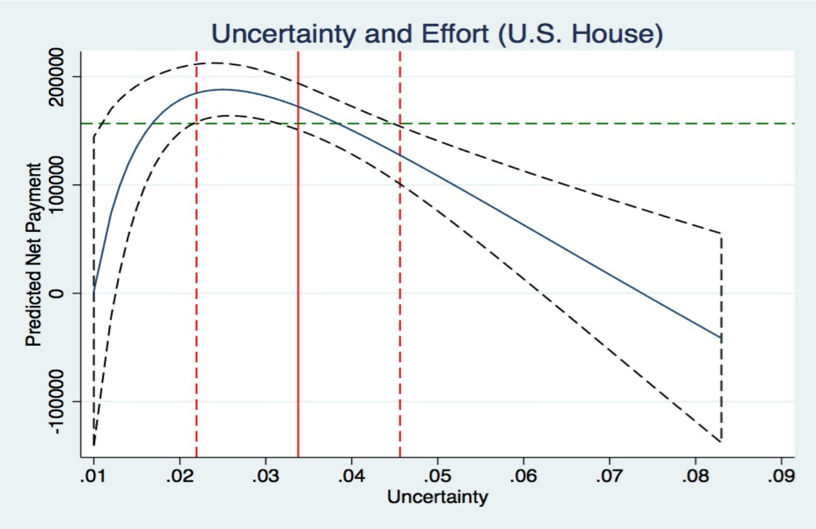
Adding uncertainty to standard model captures (2) — (4)

Overview


Uncertainty and Effort (U.S. House)
Predicted Net Payment
200000
100000
0
-100000
.01
.02
.03
.04
.05
.06
.07
.08
.09
Uncertainty

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Goal: use multi-dimensional ideal-point estimation to identify measures of uncertainty

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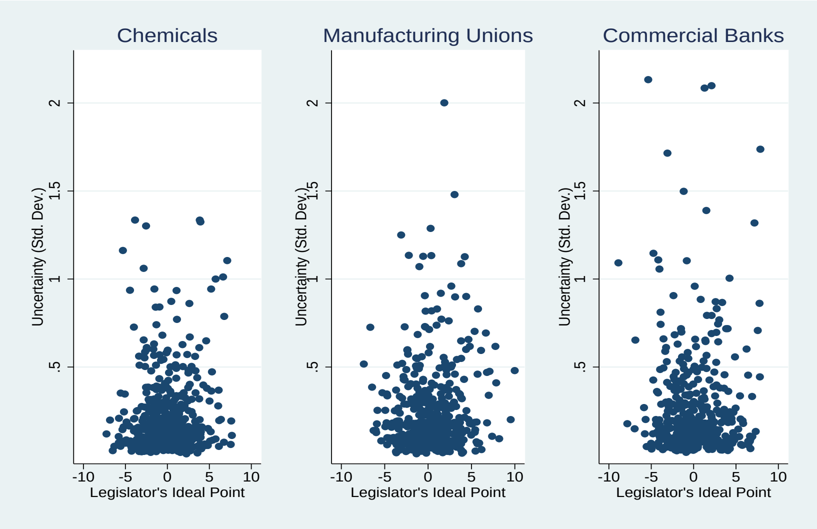
Chemicals
Manufacturing Unions
Commercial Banks
Uncertainty (Std. Dev.)
.5
1
1.5
2
-10
-5
0
5
10
Legislator's Ideal Point

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  - Take ideal point to be linear: $\alpha - \beta i$

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   ii. Uncertainty about preferences realized: $\underline{\theta} = (\theta_{-.5}, \theta_0, \theta_{.5})$
   iii. Each legislator votes for her preferred policy

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- Assuming θ_i i.i.d. $\sim$ Logistic $(0,1) := \frac{1}{1+e^{-(\beta i - \alpha - a_i + b_i)}}$

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- In three-seat legislature, maximize [probability $\geqslant 2$ legislators vote for s] $\times W_B -$ bribes

Vote Buyer B's Objective Function

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Let $S(i) = 1$ denote legislator i votes for the status quo

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$$\max_{b_{-.5}, b_0, b_{.5}} W_B \Big[\Pr(S(-.5) = 1) \Pr(S(0) = 1) (S(.5) = 0) + \\ \Pr(S(-.5) = 1) \Pr(S(0) = 0) \Pr(S(.5) = 1) + \\ \Pr(S(-.5) = 0) \Pr(S(0) = 1) \Pr(S(.5) = 1) + \\ \Pr(S(-.5) = 1) \Pr(S(0) = 1) \Pr(S(.5) = 1) \Big] - \sum_{j \in \{-.5, 0, .5\}} b_j$$

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$$\left[\frac{e^{-Z}+e^{-Y}}{(1+e^{-Z})(1+e^{-Y})}\right]\frac{e^{-X}}{(1+e^{-X})^2}=\frac{1-\lambda_X}{W_B} \quad (1)$$

$$\left[\frac{e^{-X}+e^{-Z}}{(1+e^{-X})(1+e^{-Z})}\right]\frac{e^{-Y}}{(1+e^{-Y})^2}=\frac{1-\lambda_Y}{W_B} \quad (2)$$

$$\left[\frac{e^{-X}+e^{-Y}}{(1+e^{-X})(1+e^{-Y})}\right]\frac{e^{-Z}}{(1+e^{-Z})^2}=\frac{1-\lambda_Z}{W_B} \quad (3)$$

$$b(0)\geqslant 0 \qquad b(-.5)\geqslant 0 \qquad b(.5)\geqslant 0$$

$$\lambda_X \geqslant 0 \qquad \lambda_Y \geqslant 0 \qquad \lambda_Z \geqslant 0$$

$$\lambda_X\cdot b(0)=0 \qquad \lambda_Y\cdot b(-.5)=0 \qquad \lambda_Z\cdot b(.5)=0$$

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- She wants x to win instead of s
  - Leg i votes for x w/probability

$$1 - \frac{1}{1 + e^{-(\beta i - \alpha - a_i + b_i)}} = \frac{e^{-(\beta i - \alpha - a_i + b_i)}}{1 + e^{-(\beta i - \alpha - a_i + b_i)}}$$

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$$\frac{e^{-Y}+e^{-Z}}{\left(1+e^{-Y}\right)\left(1+e^{-Z}\right)}\frac{e^{-X}}{\left(1+e^{-X}\right)^2}=\frac{1}{W_B} \tag{4}$$

$$\frac{e^{-X}+e^{-Z}}{\left(1+e^{-X}\right)\left(1+e^{-Z}\right)}\frac{e^{-Y}}{\left(1+e^{-Y}\right)^2}=\frac{1}{W_B} \tag{5}$$

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Two non-negative bribes

When Vote Buyer B pays bribes to exactly two legislators, the bribes are such that the two bribed legislators' ideal points gross of bribes are equalized. Which two legislators are bribed depends on the bias parameter α.

Three Non-Negative Bribes

Similar intuition for the case where all three legislators are bribed:

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When Vote Buyer B pays bribes to exactly one legislator, it may be any one of the three legislators depending on the bias parameter α.

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No Non-Negative Bribes

When Vote Buyer B has a low willingness to pay, he does not bribe any legislator.

Varying Uncertainty Across Legislators

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Conjecture

When there is no bias in the positions of the legislators ($\alpha = 0$), the bribes of legislators whose ideal points are at the median in terms of uncertainty receive the highest relative bribes.

Some Possibilities...

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Both Vote Buyers Bribe

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- One root: zero or $X_B < 0$

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- Derive tight identification of empirical estimates from structural model
- Provide micro-founded explanations for the variation in uncertainty that lobbies face

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- helps in understanding lobbying strategies
- may shed light on why some lobbies are more successful than others
- will help in the identification of measures of uncertainty that can be used in many applications