Between a Rock and a Hard Place: Optimizing agent choice under uncertainty

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EITM Summer Institute
University of Houston
26 June 2014

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The puzzle

- What are the consequences of "decentralization"?
  - Policy outputs (i.e., distributive and redistributive policies)

  - Outcomes of interest (i.e., welfare, efficiency, equity)?

  - Public administration (i.e., political control, performance, effectiveness of managerial strategies)

- Decentralization is not exogenous to political incentives.

- Why do governments decentralize policy authority?

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A motivating case

- 1935 U.S. Social Security Act
- One of the first nation-wide attempts to enact social welfare policy, including...
    - **Federal** old-age insurance (social security)
    - **State** unemployment insurance
- Same bill (the Economic Security Bill), same advisors, same decision makers, same political and economic context.
- Not altogether different policies: social insurance based on prior work experience.

- **Why delegate unemployment insurance and social security to different agents?**

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Why delegate?

- Why do governments delegate authority?
- Why *give away* power?

  - Not a new question. Lots of proposed answers.
  - Specifically within the public administration literature, there exist several theories of legislative delegation to central agencies.

Why delegate? - a primer on agency theory

- Legislatures delegate policy authority because they have scarce resources.

- As "principals," they select "agents" to implement and administer public policy.

- Agents may have different:
  - preferences,
  - information, or
  - incentives/payoffs.

- Principals **optimally choose** an agent.

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Why delegate?

- Information and uncertainty (McNollGast 1987, Epstein and O'Halloran 1999)

- Insulation (Horn 1995) and preservation of existing alignments (McNollGast 1987, 1989)

- Blame avoidance (Fiorina 1982)

- Satisfy coalition divergence or heterogeneity

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- Why might a government delegate authority *to other governments*?
  - Also not a new question.
  - Especially within comparative politics, there are many (competing) explanations. Many of which have yet to be tested, properly.
- Delegation by decentralization involves different costs and benefits than delegation to a central agency.

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Why decentralize?

- Coordination of externalities (Oates 1971, Rogers 2012, Besley and Coate 2003)
    - "Welfare magnets" (Peterson 1990) and a "race to the bottom"
    - Most relevant if administrative delegation is unfunded

- Experimentation, diffusion, and learning (Shipan and Volden 2008, and Blaustein 1993, Atkinson 1941)
- Decentralization compounds the monitoring problem and involves a "loss of control" (Whitford 2002)
    - Coordination
    - Local political influences

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The Question

Why is delegation made to a decentralized set of agents, rather than to one centralized agency?

Why do legislatures delegate to sub-national governments, rather than to a single federal agency?

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EITM Step One: Concepts

My question:

How do principals choose agents?

Why do legislatures choose to delegate to sub-national governments, rather than to a single central agency?

- **Theoretical concept:** decision making and strategic interaction.

- **Statistical concept:** nominal choice

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My question:

Why do principals (legislatures) choose to delegate to agent A or agent $\sim$A?

- **Theoretical analogue:** game theoretic interaction, and utility maximization
  - I assume the principal (legislature) will use choose an optimal (utility maximizing) action, given the actions of other players.

- **Statistical analogue:**

EITM Step Two: Theoretical Analogue

Is delegation **discrete** or **continuous**?

Discrete

- Delegate, D, to Agent A **or** Agent $\sim$A
- One discrete choice
- $D \in \{0, 1\}$
- 3 equilibria
- A mixed strategy equilibrium

Continuous

- Delegate, D, to Agent A **and/or** Agent $\sim$A
- One continuous choice
- $D = [0, 1]$
- Infinite equilibria
- Utility maximizing equilibria

EITM Step Two: Statistical Analogue

Is delegation **discrete** or **continuous**?

Discrete

- Delegate, D, to Agent A **or** Agent ~A
- One discrete choice
- $D \in \{0, 1\}$
- 3 equilibria
- A mixed strategy equilibrium

- Discrete choice model
- Logistic regression

Continuous

- Delegate, D, to Agent A **and/or** Agent ~A
- One continuous choice
- $D = [0, 1]$
- Infinite equilibria
- Utility maximizing equilibria

- Consumption model
- OLS or Beta regression

Is delegation **discrete** or **continuous**?

Empirically, delegation and
decentralization is rarely
discrete.

Continuous

- Delegate, D, to Agent A
  and/or Agent $\sim$A
- One continuous choice
- $D = [0, 1]$
- Infinite equilibria
- Utility maximizing
  equilibria

- Consumption model
- OLS or Beta regression

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EITM Step Three: Unite Theory and Statistical Analogues

- I have used a game theoretic approach to model the legislature's delegation choice, $0 \leq D \leq 1$.
  - Incomplete information.
  - The total amount of authority to be delegated is given.
  - D is the proportion of authority delegated to the *decentralized* agents.
  - $1 - D$ is the proportion of authority delegated to the *centralized* agents.

- $D = f(w, \alpha, p, \delta, \gamma, c_c, c_p)$

- This model generates propositions about decentralized delegation in equilibrium.

- Can produce testable empirical hypotheses of the conditions under which more or less delegation to decentralized agents is likely.

Where things stand today

- I have a extensive game, which could be improved.

- I have derived some propositions and hypotheses.

- I have collected a good bit of data (cross-national and extensively within the U.S.), but have not yet decided how to test my expectations.

- Sorry, no hypothesis testing today.

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Theory statement

- Legislature acts as a principal to select an agent.

- Subnational units and national agencies are substitute administrative agents, and a legislature's choice of delegation distribution is a function of:

    - Resource costs of controlling a decentralized set of agents (c_c)
    - Political costs of inefficient policy allocation (c_p)

        - Heterogeneity of preferences within the winning legislative coalition will increase this cost

    - Divergence of policy proposals ($1 - \alpha$)
    - Threat of veto player block or overturn (δ, γ)
    - Likelihood that the agency and legislature will have convergent policy preferences (p)

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The Policies and the Principal

- Two policy proposals: w_C and $w_{\sim C}$
  - where $\alpha = |w_C - w_{\sim C}|$
  - Let $w_C = 1$ and $0 \leq w_{\sim C} \leq 2$, such that $\alpha w_{\sim C} = w_C$
  - $(1 - \alpha)$ is the distance between w_C and $w_{\sim C}$ (divergence)
  - α represents the degree of policy convergence

- Winning legislative coalition prefers $w_C \Rightarrow w$

- Legislature delegates policy implementation to:
  - National agency (d_A)
  - Sub-national units (d_S)

- Proportion of policy discretion to the subnational units is $D = \frac{d_S}{d_A + d_S}$
  - Administrative decentralization

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There exist two national agency types:

- Convergent agency, C, prefers w when legislature prefers w.

- Divergent agency, $\sim C$, prefers αw when legislature prefers w.

- The agency is convergent with a probability, p, where $0 \leq p \leq 1$.
    - Institutional and electoral factors affect p

- The agency is the only actor with perfect information of its type.
    - Incomplete information

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Agent Type: Subnational governments

There exist two types of subnational unit (states):

- *State 1*, most prefers w.

- *State 2*, most prefers αw.

- Given their own policy, both types prefer a uniform policy across all states.

  - Each state experiences a disutility (efficiency loss), $0 < \pi < \alpha$, if heterogeneous policies are implemented.

- $0 \leq w \leq 1$

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Costs

- Cost of control, c_c

- Cost of policy inefficiency, c_p

- $0 \leq c_c \leq w$
- $0 \leq c_p \leq w$
- Both have diminishing marginal effects.

Costs of control, c_c

- If administrative delegation is decentralized, the legislature pays a cost, c_c, for:
    - Greater information and monitoring costs
    - Policy adjustment or re-centralization
    - Local influences

- Empirically, c_c may be a function of:
    - Local capacity (-)
    - Preferred insulation (-)
    - Federalism (+)
    - Fiscal autonomy (+)

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Costs of policy inefficiency, c_p

- If administrative delegation is centralized, there is an electoral cost of implementing a uniform policy: c_p

- Policy allocation inefficiency:

    - Legislature pays a political cost, $\frac{1}{2}c_p$, in *State 1* for implementing αw.

    - Legislature pays a political cost, $\frac{1}{2}c_p$, in *State 2* for implementing w.

- c_p may be a function of the salience or clientele size of the policy

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Discounting for the role of veto players

- The legislative coalition's payoff from a uniform national policy is discounted by δ, the probability that a veto player blocks or overturns the uniform national policy.

- Similarly, the payoff from a decentralized policy is discounted by γ.
  - δ and γ should therefore increase as the number of veto players increases

- $0 <= \delta + \gamma <= 1$, where the probability of no veto $\phi = 1 - \delta - \gamma$

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When the national agency is convergent (of type C), the legislature's utility from complete delegation to the agency is equal to:

$$U_L(d_A|C) = \gamma(w - (1 - D)c_p) \tag{1}$$

When the national agency is convergent (of type $\sim C$), the legislature's utility from complete delegation to the agency is equal to:

$$U_L(d_A|\sim C) = \gamma(\alpha w - (1 - D)c_p) \tag{2}$$

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Under the assumption of uncertainty, the expected utility function for the legislature is represented by equation 3, where p represents the expected probability of a convergent national agency.

$$U_L(d_A) = pU_L(d_A|C) + (1-p)U_L(d_A|\sim C) \tag{3}$$
$$= p\gamma(w - (1-D)c_p) + (1-p)\gamma(\alpha w - (1-D)c_p) \tag{4}$$
$$= \gamma[w(p + (1-p)\alpha) + (1-D)c_p] \tag{5}$$

The legislature's utility from delegation to the states is equal to:

$$U_L(d_S) = \delta \frac{1}{n_s} \sum_{i=1}^{n_s} w_i - Dc_c \tag{6}$$

where $w_i \in \{w, \alpha w\}$, and $n_s = 2$,

$$= \delta [\frac{w(1 - \alpha)}{2} - Dc_c] \tag{7}$$

When $0 < D < 1$, the legislature's utility is equal to:

$$
\begin{aligned}
U_L(D) =& \gamma(1-D)[p(U_L(d_A|C)) + (1-p)(U_L(d_A| \sim C))] \\
& + \delta D(U_L(d_S))
\end{aligned}
\tag{8}
$$

$$
\begin{aligned}
=& \gamma[(1-D)(w(p+(1-p)\alpha) - (1-D)c_p)] \\
& + \delta[D(\frac{w}{2}(1+\alpha) - Dc_c)] \\
& + (1-\delta-\gamma)[D(\frac{w}{2}(1+\alpha) - Dc_c) \\
& + (1-D)(w(p+(1-p)\alpha) - (1-D)c_p)]
\end{aligned}
\tag{9}
$$

The centralized agency:

- If C, the central agency receives a the payoff equal to w if it implements w, and αw if it implements αw.
- If $\sim C$, the central agency receives a payoff equal to αw if it implements w, and w if it implements αw.
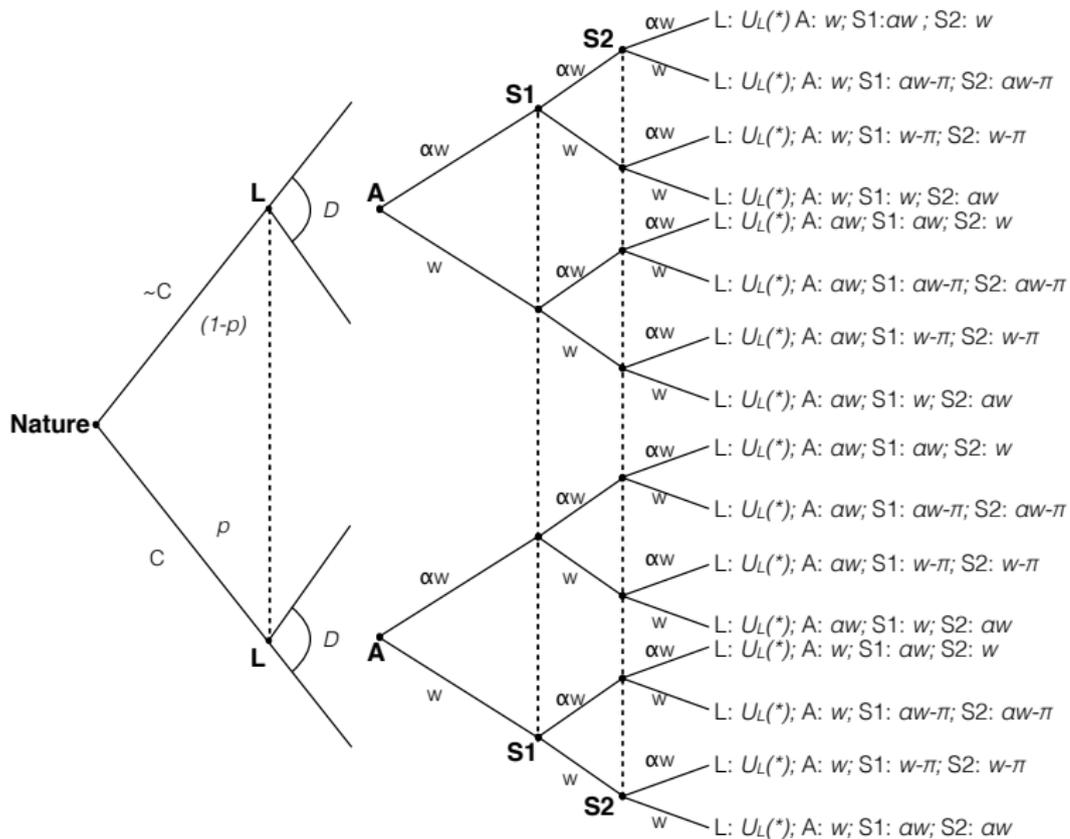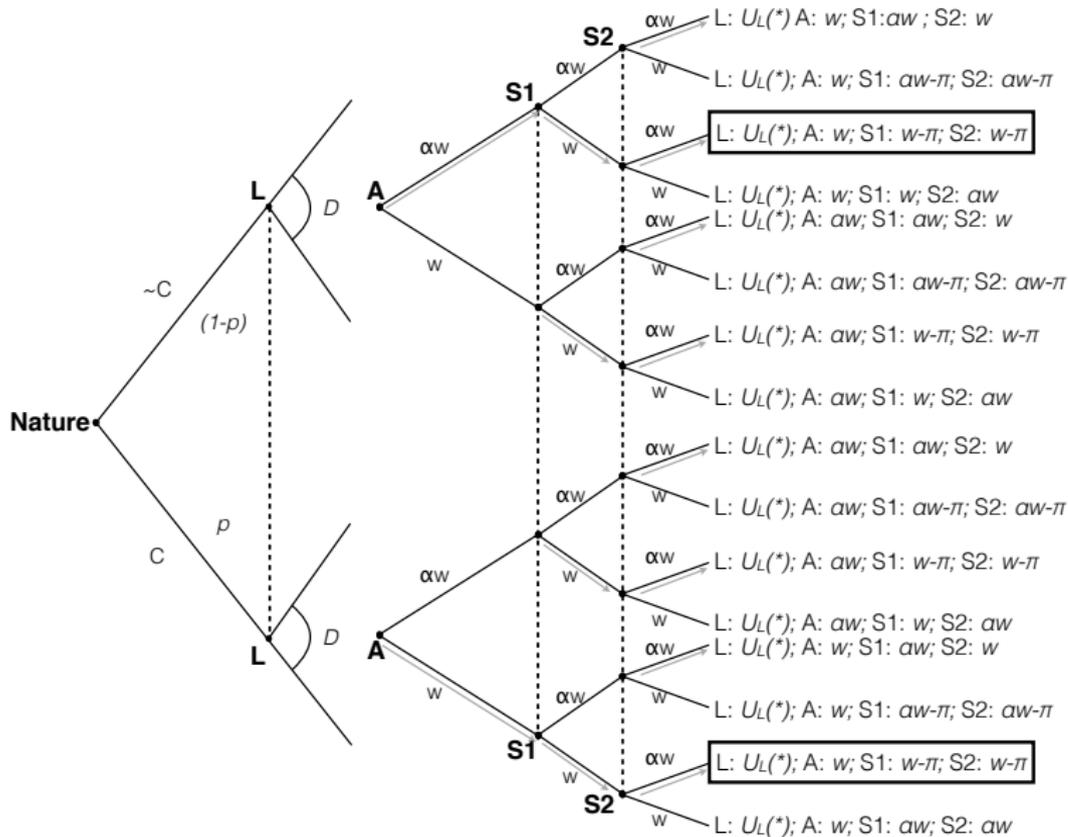
The decentralized agents:

- Each state receives a payoff equal to w if it implements their preferred policy, and equal to αw if it implements their less preferred policy.
- If different policies are implemented among the agents, the payoff is reduced by π, where $0 < \pi < \alpha$.

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The sequence of the game is as follows:

- Nature chooses agency type as convergent or divergent, $T = \{C, \sim C\}$
- The legislature chooses D, the proportion of administrative authority delegated to subnational governments, where $0 \leq D \leq 1$.
- The agents set their policy,
    - The national agency's strategy set is
      $\{(w \mid C, w \mid \sim C)(w \mid C, \alpha w \mid \sim C)(\alpha w \mid C, w \mid \sim C)(\alpha w \mid C, \alpha w \mid \sim C)\}$
      and
    - The strategy set for each lower level government $i \in \{1, 2\}$ is $\{w, \alpha w\}$.
- Agent type is revealed and payoffs are realized.

L: $U_L(*)$ A: w; S1: aw ; S2: w

L: $U_L(*)$; A: w; S1: aw-π; S2: aw-π

L: $U_L(*)$; A: w; S1: w-π; S2: w-π

L: $U_L(*)$; A: w; S1: w; S2: aw

L: $U_L(*)$; A: aw; S1: aw; S2: w

L: $U_L(*)$; A: aw; S1: aw-π; S2: aw-π

L: $U_L(*)$; A: aw; S1: w-π; S2: w-π

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L: $U_L(*)$; A: w; S1: w-π; S2: w-π

L: $U_L(*)$; A: w; S1: aw; S2: aw

Equilibrium strategies

- State 2 : $\{\alpha w\}$

- State 1 : $\{w\}$

- Agency : $\{w \mid C, \alpha w \mid \sim C\}$

- Legislature : $\max_D U_L(D)$

Equilibrium D

$$D^* = \frac{\frac{w}{2}(1+\alpha)(1-\gamma) - w(p + (1-p)\alpha)(1-\delta) + 2c_c(2-\gamma-\delta)}{2(c_p(2-\gamma-\delta) + 2c_c(1-\gamma-\frac{\delta}{2}))}$$

(10)

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Simulation

Randomly generated data subject to the following constraints:

$w = 1$
$\alpha < 1$
$0 < p < 1$
$0 < \delta < 1$
$0 < \gamma < 1$
$0 < (\delta + \gamma) < 1$
$0 < c_c < .5$
$0 < c_p < .5$

Figure : Decentralization in equilibrium
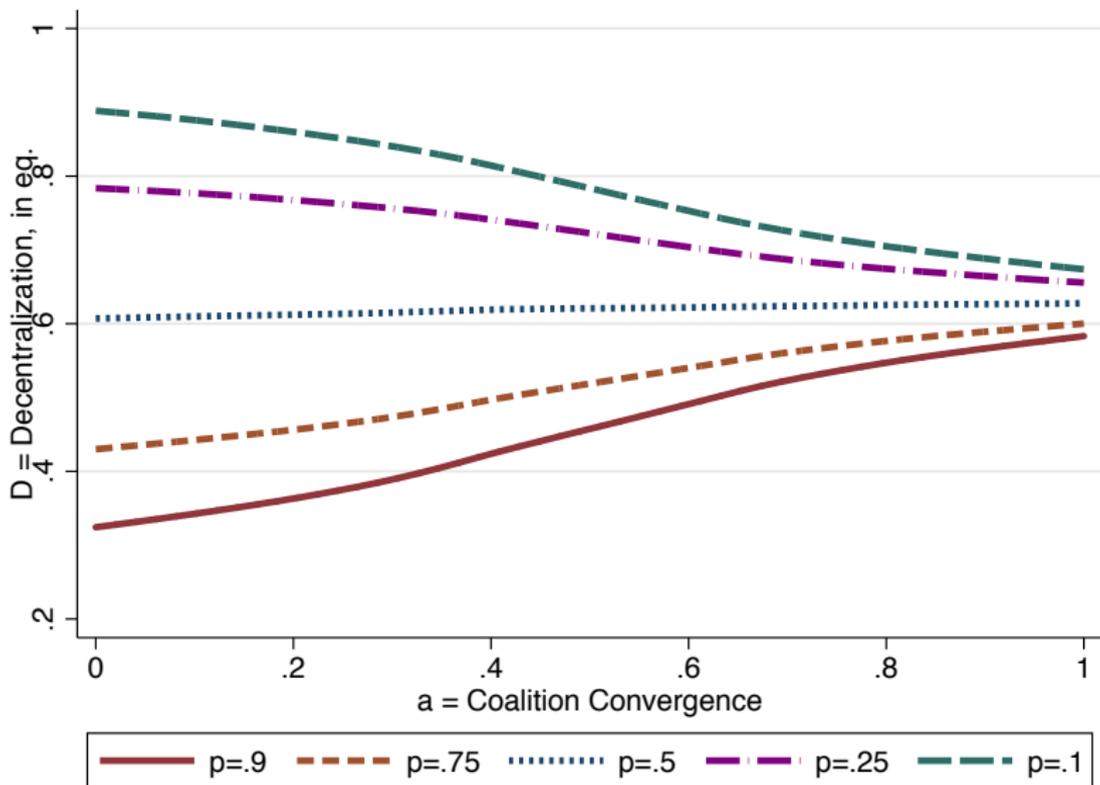
Policy convergence in equilibrium

The marginal effect of policy convergence, α, in equilibrium:

$$\frac{\partial D^*}{\partial \alpha} = \frac{\frac{w}{2}(1-\gamma) - w(1-p)(1-\delta)}{2(c_p(2-\gamma-\delta) + 2c_c(1-\gamma-\frac{\delta}{2}))} \tag{11}$$

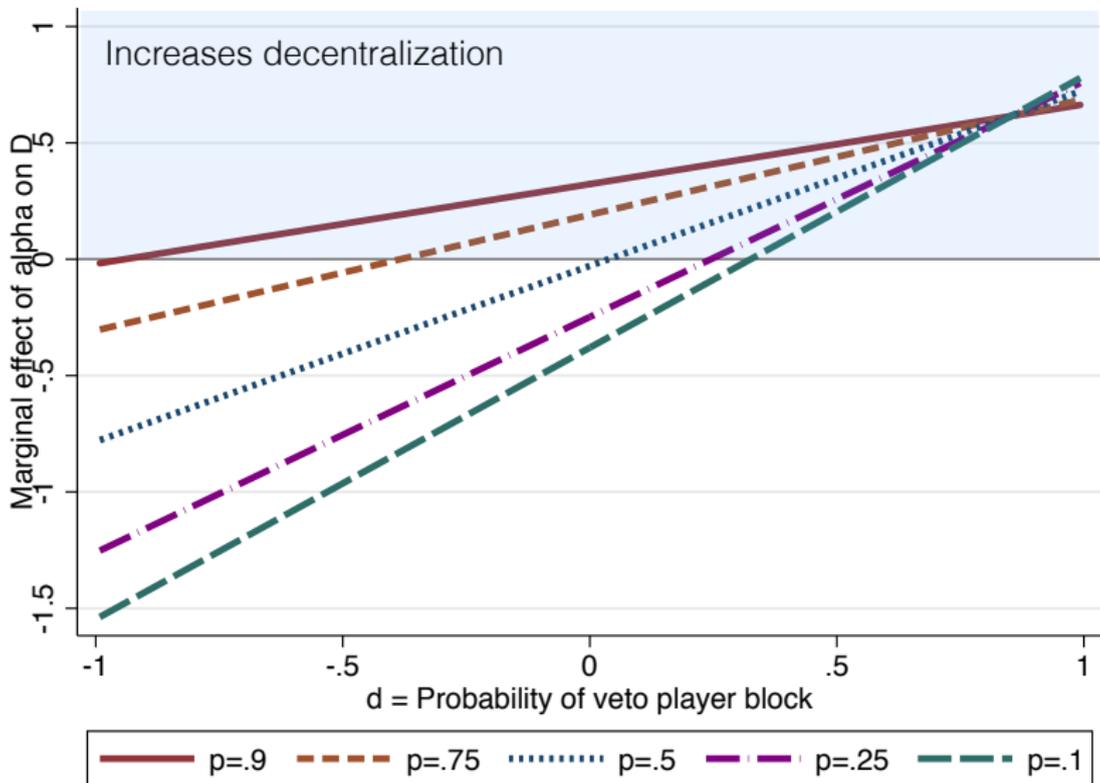Figure : Marginal effect of α on D in equilibrium

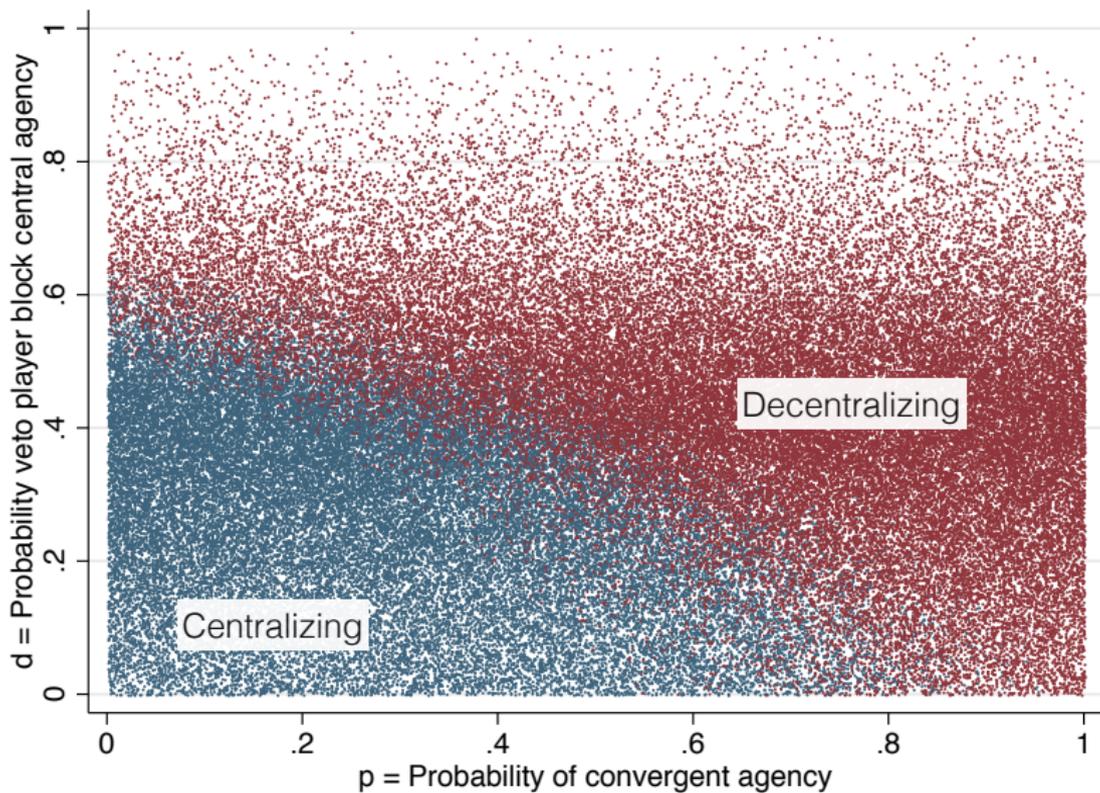Figure : Marginal effect of α on D in equilibrium
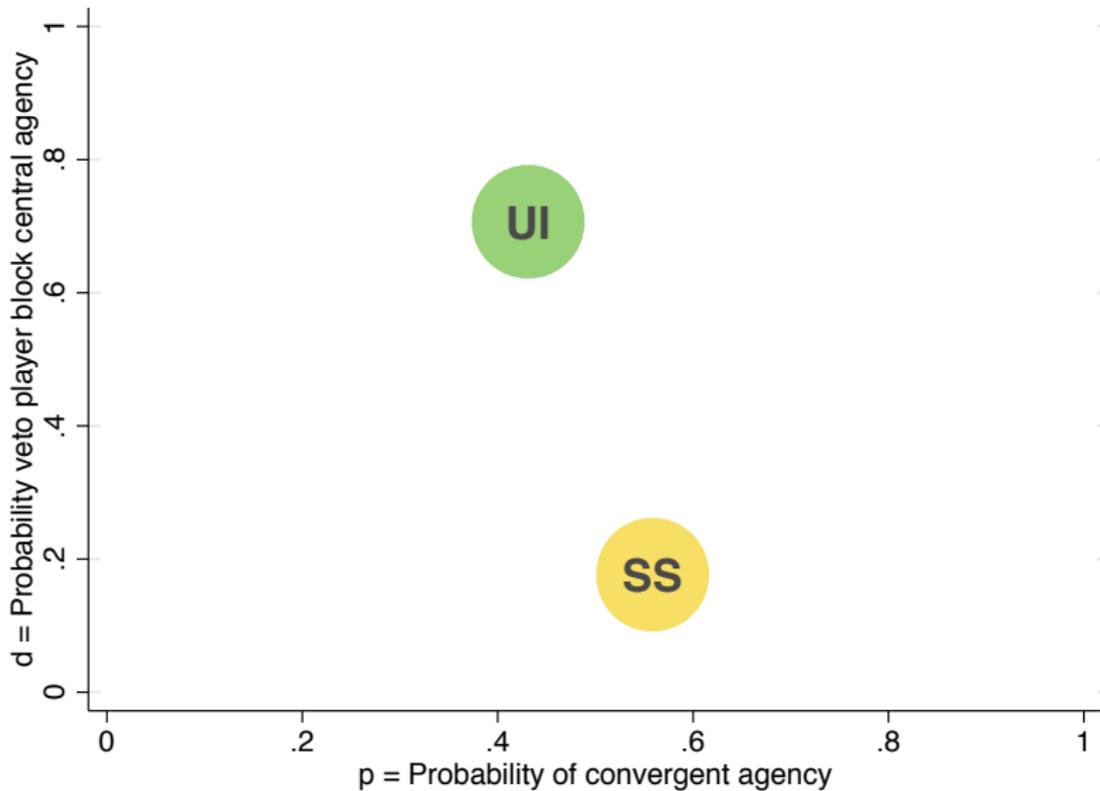
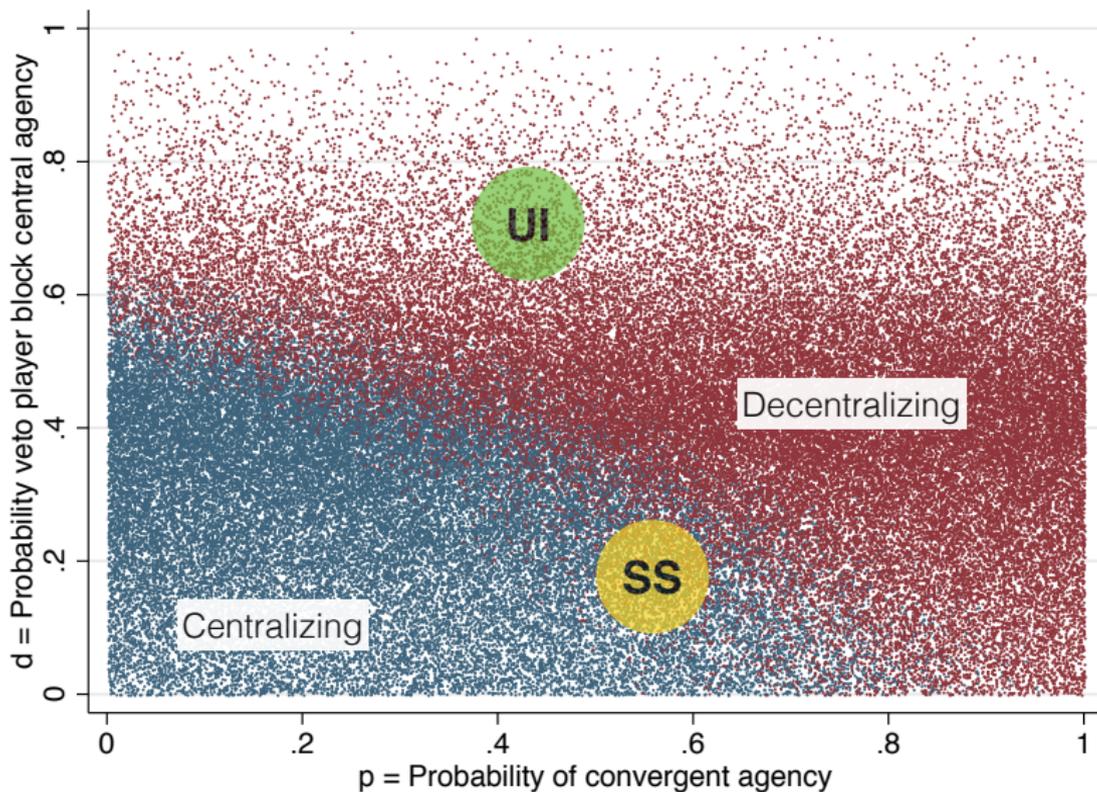Figure : Return to the empirical puzzle

Figure : Marginal effect of α on D in equilibrium

Some empirical expectations

- Variance in decentralization decreases with convergence.
- Divergence may have a positive or negative effect on decentralization.
    - The marginal effect of convergence is conditional on both the probability of veto player behavior and the probability of a convergent agency.
    - Convergence will increase decentralization when the probability of a veto of centralization is high.
    - Convergence will decrease decentralization when the probability of a veto of centralization is low.
- Convergence, uncertainty of agent type, and veto player threat are interactive with each other.

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- How to test these expectations?

- $D =$ proportion of total delegation that is given to the decentralized agent.

- Dependent variable: Sub-national authority as a proportion of total authority, of a given policy area.

  - Let's say that "authority" can be measured using expenditures, and let's consider social welfare policy.

  - Example: sum of state spending on all social programs as a proportion of total social spending in a country.

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Parameter	Concept	Theoretical definition	Range	Potential operationalization
D	Decentralized administrative delegation	$D = \dfrac{d_S}{d_A}$	$0 \leq D \leq 1$	Proportion of subnational administration or Policy decisions
α	Policy convergence	$\alpha = \left\| \dfrac{w_C - w_{-C}}{w_C} \right\|$	$0 \leq a \leq 1$	Ideological distance between policy proposals *(polarization?)*
δ, γ	Probability of veto player block		$0 \leq \delta + \gamma \leq 1$	No. of veto players
p	Probability of Convergent Agency	$p = \Pr(C)$	$0 \leq p \leq 1$	PR vs. Majoritarian
				Likelihood of reelection
				Competitiveness of elections
				Preference of executive
w	Legislature's preferred policy	$w_c = 1$	$-\infty < w_C < \infty$	Ideology of majority in legislature
c_p	Political cost of centralized control	$c_p = X^p$	$-\infty < cp < \infty$	Federalism
				Salience of policy
				Clientele size
c_c	Costs of decentralized control	$c_c = X^c$	$-\infty < cc < \infty$	State bureaucratic capacity
				Policy spillovers
				Desire for insulation
				Fiscal autonomy
π	Efficiency loss to states from heterogeneous policies		$0 < \pi < \alpha$	*Not a parameter in F.O.C.*

Figure : Social Welfare Expenditures, 2010
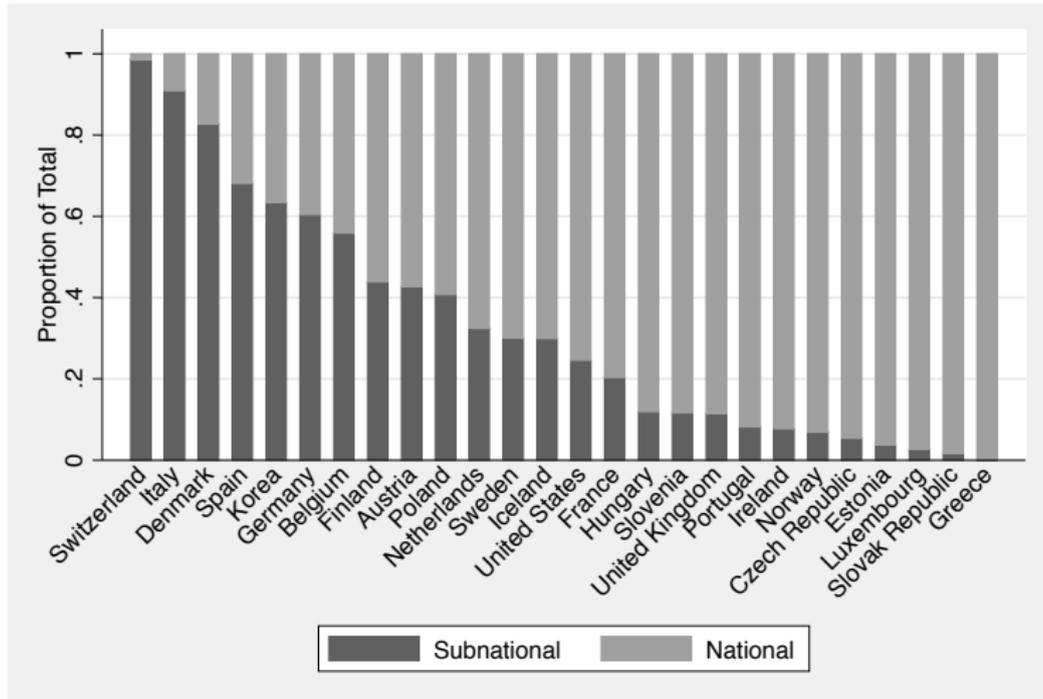
Source: OECD National Accounts, 2010

Possible Data

- Panel data is dynamic.
  - Signaling
  - Learning
  - Repeated interaction

- Expenditures are the result of many of factors (entire literatures are devoted to modeling public spending).

- Other typical "decentralization" variables:
  - Regional Authority Index, 42 democracies, 1950-2006 (Hooghe, Marks, Schakel, 2008) – too general.

- My model focuses on the *choice* to delegate.

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- Survey of 120 Latin American mayors on the choice to delegate policy authority to a private agency or to their own municipality (Avellaneda, 2014).
    - Includes questions of policy salience, context, and agent competence.

- Inter-governmental grants in the OECD countries, 2000-2010
    - State and local mandatory, discretionary, and non-earmarked grant revenue
    - No policy specific variables (c_p, c_c, p)

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- Experimental design involving preference differences, uncertainty, and delegation decisions

- Code legislation

Thank you.
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