Efficiency with Political Power Dynamics and Costly Policy Change

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"Just tell me which part Obama wrote."

Some headlines from the media

"The Trump Administration Is Reversing 100 Environmental Rules. Here's the Full List", New York Times, July 15, 2020

"Obama Begins Reversing Bush Climate Policies", Reuters, January 26, 2009

"Bush Team Is Reversing Environmental Policies", The New York Times, November 18, 2001

"Clinton Kills Controversial Quayle Panel", Los Angeles Times, 23 January 1993

The "ping-pong" is not exclusive of the US or environmental regulations

Questions

Under what conditions policy reversals arise when they are costly?

What are the efficiency implications of policy reversals?

What is the role of “favoritism"?

Introduction

Two parties decide on a spatial policy on a particular issue in each period over an infinite horizon.

There is political turnover – the party in power changes stochastically.

Parties have different ideal policies (polarization).

Changing policy is costly.

The incumbent party and the out-of-power party potentially do not share the burden of the cost equally (favoritism).

Introduction: main results

Pareto efficient allocations cannot involve policy reversals and efficient policies are moderate policies.

When polarization is high, there is a unique equilibrium. This equilibrium is inefficient due to perpetual policy reversals.

When polarization is low but favoritism is high, equilibrium can be inefficient as a result of "overshooting" or "undershooting" due to coordination failures, but there are also efficient equilibria.

When neither polarization nor favoritism is high, equilibrium is always efficient in the long run.

Introduction: main results

When the cost of policy change is sufficiently small:

- If the initial status quo policy is moderate, then any increase in the cost of policy change increases welfare.
- An increase in favoritism results in larger fluctuations in equilibrium policies and reduces welfare.

Overall, no trade-off between equity and efficiency.

Methodologically: power of shape refinement of stationary MPE.

Related literature

Dynamic political economy with endogenous status quo: Baron (1996), Kalandrakis (2004), Bowen, Chen, Eraslan (2014), Anesi and Seidman (2015), Dziuda and Loeper (2016), Bowen, Chen, Eraslan, Zapal (2017), Callander and Rahia (2017)
Survey of this literature: Eraslan, Evdokimov, Zápal (2020)

Costly policy change: Gersbach and Tejada (2018), Gersbach, Jackson, Muller and Tejada (2020), Dziuda and Loeper (2019)

Shape refinement: Gersbach, Jackson, Muller and Tejada (2018)

Model

Two parties, L and R, decide policy $x_t \in \mathbb{R}$ on a particular issue taking as given x_{t-1}, in each period $t = 1, 2, \ldots$

Adjusting the policy by an amount z costs Cz. The cost share of incumbent is γ.

Marginal cost of policy change:

> $c = \gamma C$ for the incumbent party and $c' = (1 - \gamma)C$ for the out-of-power party.

The utility for party i from policy x is $u_i(x)$, u_i strictly concave, $u_L'(x) < u_R'(x)$ for all x.

Parties discount the future at a rate δ.

Political system

Party in power at time t: $\kappa_t \in \{L, R\}$.

Party κ_t sets the policy at time t.

Power fluctuates stochastically.

p: probability that the incumbent remains in power.

Benchmark: dictatorship

Dictator i's problem is a single agent dynamic programming problem.

If x is the status quo policy and the dictator moves the policy to x', its stage payoff is

$$u_i(x') - c|x' - x|.$$

The value function satisfies

$$V_i(x) = \max_{x' \in \mathbb{R}} u_i(x') - c|x' - x| + \delta V_i(x')$$

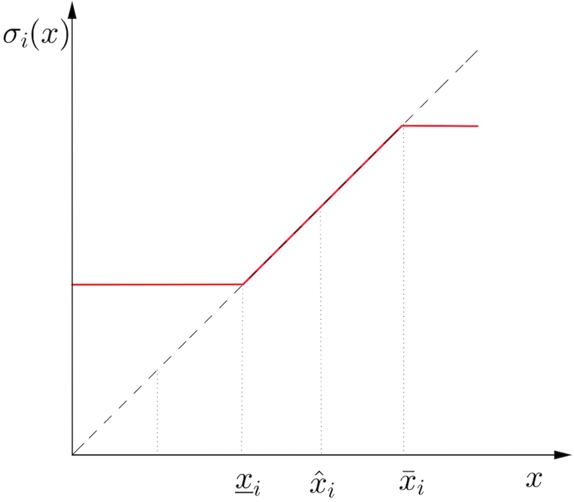
and the policy function satisfies

$$\sigma_i(x) \in \arg\max_{x' \in \mathbb{R}} u_i(x') - c|x' - x| + \delta V_i(x')$$

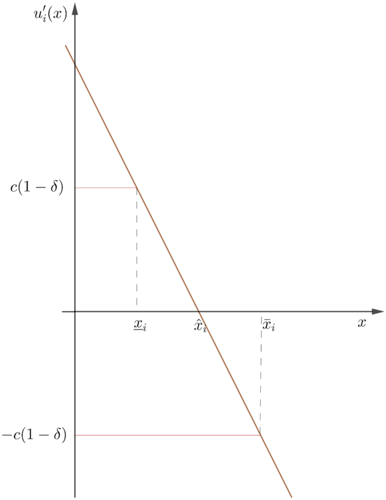
for all $x \in \mathbb{R}$.

Benchmark: dictatorship

Optimal policy function for dictator i:



Dictatorship



$\underline{x}_i$: minimum acceptable policy for party i, is the solution to

$$\frac{u_i'(x)}{1-\delta} = c.$$

$\bar{x}_i$: maximum acceptable policy for party i, is the solution to

$$\frac{u_i'(x)}{1-\delta} = -c.$$

Benchmark: Pareto efficiency

Let $\kappa_t \in \{L, R\}$ be the identity of the incumbent at t.

An *allocation* is a sequence of functions yielding the policy at period t depending on the initial state and on $\kappa^t = (\kappa_1, \ldots, \kappa_t)$

$$x^t : \mathbb{R} \times [L, R]^t \to \mathbb{R}$$

$$x^t(x_0, \kappa^t) = x_t$$

Benchmark: Pareto efficiency

Proposition

Pareto efficient policy allocations do not have policy reversals:

For any initial policy x_0 *and initial incumbent* κ_1*, either*

$$x_0 \leq x^t(x_0, \kappa^t) \leq x^{t+1}(x_0, \kappa^t, \kappa_{t+1}) \text{ for all } t, \kappa^t \text{ and } \kappa_{t+1}$$

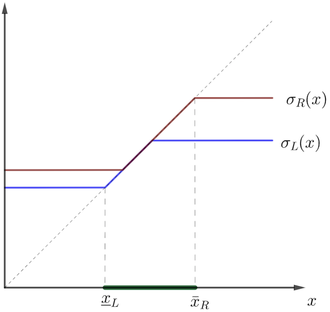
or

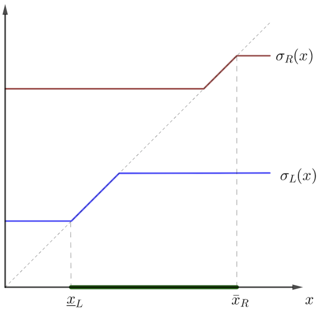
$$x_0 \geq x^t(x_0, \kappa^t) \geq x^{t+1}(x_0, \kappa^t, \kappa_{t+1}) \text{ for all } t, \kappa^t \text{ and } \kappa_{t+1}.$$

Benchmark: Pareto efficiency (constant allocations)

Proposition

Suppose $c' \geq c$. There exists initial policy x_0 and initial incumbent κ_1 such that if an allocation $\mathbf{x}$ satisfies $x^t(x_0, \kappa^t) = \alpha \in [\underline{x}_L, \bar{x}_R]$ $\forall t \geq 1$ and κ^t, then it is Pareto efficient.

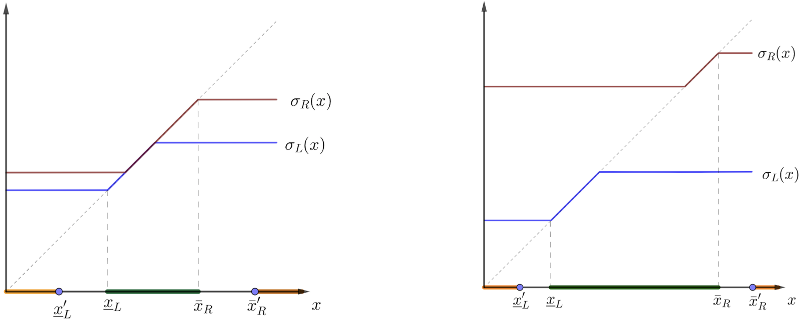




Benchmark: Pareto efficiency (constant allocations)

Proposition

Suppose $c' \geq c$. Let $\mathbf{x}$ be an allocation such that $x^t(x_0, \kappa^t) = \alpha$ for some α for all t and κ^t. If $\alpha < \underline{x}'_L$ or $\alpha > \bar{x}'_R$, then $\mathbf{x}$ is inefficient.



Strategies

Focus on stationary Markov strategies, i.e. strategies that depends only on the payoff-relevant state.

The payoff relevant state in period t is the policy x_{t-1} at the beginning of the period.

Pure strategies: $\sigma_i : \mathbb{R} \to \mathbb{R}$

> $\sigma_i(x)$ is the policy at the end of the current period when i is in power and the policy at the beginning of the current period is x.

Markov Perfect Equilibrium

An equilibrium is a pair of strategy profiles $\sigma = (\sigma_L, \sigma_R)$ and the associated value functions (V_L, W_L, V_R, W_R) such that

(E1) Given (V_L, W_L, V_R, W_R),

$$\sigma_i(x) \in \arg\max_{x' \in \mathbb{R}} u_i(x') - c|x' - x| + \delta[pV_i(x') + (1-p)W_i(x')]$$

for all $x \in \mathbb{R}$ and for all $i \in \{L, R\}$.

(E2) Given $\sigma = (\sigma_L, \sigma_R)$, the value functions V_L, W_L, V_R, W_R satisfy the following functional equations for any $x \in \mathbb{R}$, $i, j \in \{L, R\}$ with $j \neq i$:

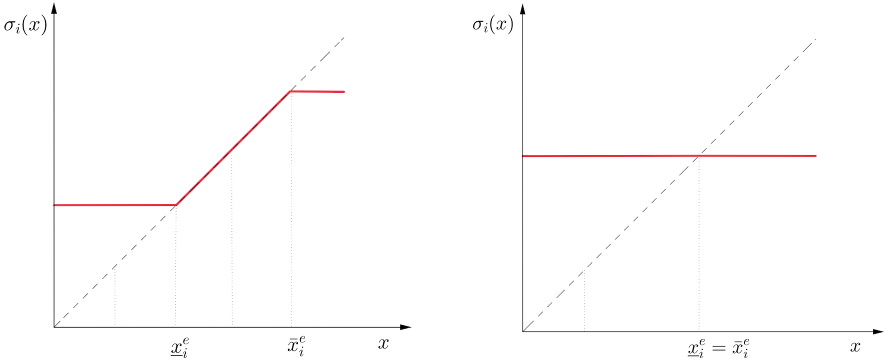
$$V_i(x) = u_i(\sigma_i(x)) - c|\sigma_i(x) - x| + \delta[pV_i(\sigma_i(x)) + (1-p)W_i(\sigma_i(x))],$$
$$W_i(x) = u_i(\sigma_j(x)) - c'|\sigma_j(x) - x| + \delta[(1-p)V_i(\sigma_j(x)) + pW_i(\sigma_j(x))].$$

Markov Perfect Equilibrium

Restrict attention to the class of stationary MPE in which the equilibrium strategy of each party is defined by two cutoffs, $\underline{x}_i^e$ and $\bar{x}_i^e$, with the property that

$$\sigma_i(x) = \begin{cases} \underline{x}_i^e & \text{if } x < \underline{x}_i^e, \\ x & \text{if } \underline{x}_i^e \leq x \leq \bar{x}_i^e, \\ \bar{x}_i^e & \text{if } x > \bar{x}_i^e. \end{cases}$$

Markov Perfect Equilibrium



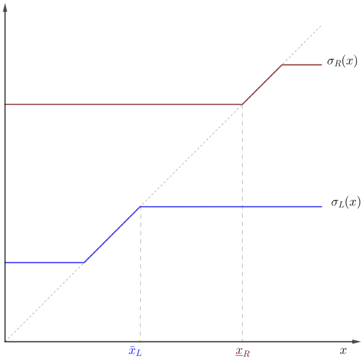


Figure: Dictator's strategies

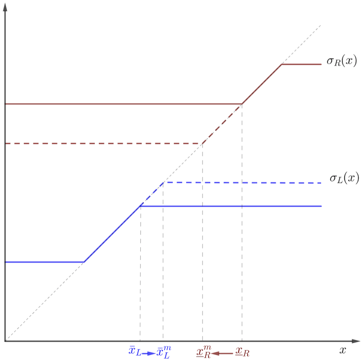


Figure: Equilibrium strategies

$\bar{x}_L^m$ and $\underline{x}_R^m$ are exogenously defined.

Moderated levels

Definition

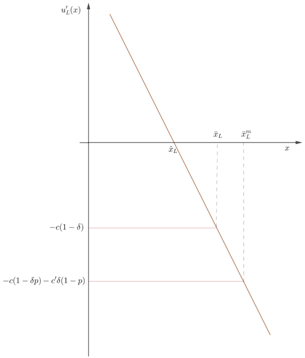
The *moderated maximum acceptable policy for L*, denoted by $\bar{x}_L^m$, is the solution to

$$u_L'(x) = -c(1-\delta p) - c'\delta(1-p).$$

Definition

The *moderated minimum acceptable policy for R*, denoted by $\underline{x}_R^m$, is the solution to

$$u_R'(x) = c(1-\delta p) + c'\delta(1-p).$$

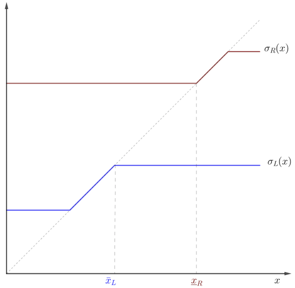


High polarization

$$c(1-\delta p)+c'\delta(1-p)\geq c(1-\delta)\Rightarrow$$

$$\bar{x}_L<\bar{x}_L^m \text{ and } \underline{x}_R^m<\underline{x}_R$$

But: $\bar{x}_L^m<\underline{x}_R^m$ is not assured.



We refer to the case $\bar{x}_L^m<\underline{x}_R^m$ as the *high polarization* case.

As $C\rightarrow 0$, we are always in the high polarization case.

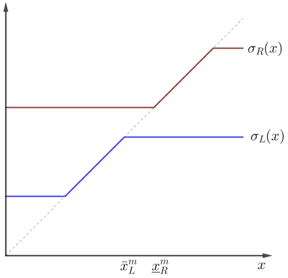
High Polarization

Proposition

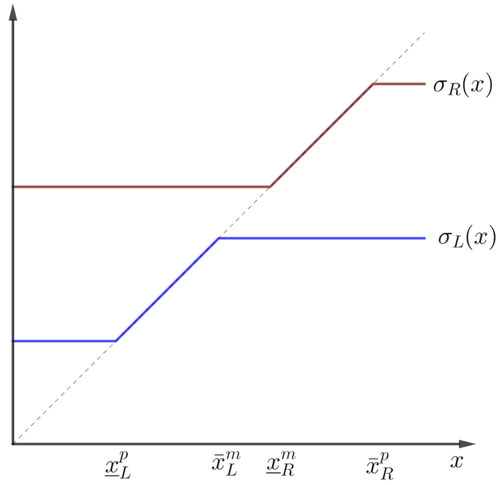
When polarization is high (i.e. $\bar{x}_L^m < \underline{x}_R^m$), a unique equilibrium exists.

Parties always reverse each other's policies

The equilibrium is inefficient due to perpetual policy reversals.



High Polarization



Precautionary levels

Definition

The *precautionary minimum acceptable policy for party i*, denoted by $\underline{x}_i^p$, is the solution to

$$u_i'(x) = c(1 - \delta p) - c'\delta(1 - p).$$

Definition

The *precautionary maximum acceptable policy for party i*, denoted by $\bar{x}_i^p$, is the solution to

$$-u_i'(x) = c(1 - \delta p) - c'\delta(1 - p).$$

Favoritism

When $\gamma < 0.5$, i.e. when $c' > c$, we say there is *favoritism*

When there is no favoritism ($\gamma = 0.5$),

$$\underline{x}_L^p = \underline{x}_L < \bar{x}_R^p = \bar{x}_R.$$

As favoritism increases, $\underline{x}_L^p \uparrow$ and $\bar{x}_R^p \downarrow$

From the definitions $\underline{x}_L^p \leq \bar{x}_L^m$ and $\underline{x}_R^m \leq \bar{x}_R^p$

So when polarization is high, i.e. when $\bar{x}_L^m < \underline{x}_R^m$, it is not possible to have $\underline{x}_L^p > \bar{x}_R^p$.

But when polarization is low, they could "cross" each other.

We say *polarization is low and favoritism is high* when $\underline{x}_L^p > \bar{x}_R^p$.

Low polarization with high favoritism ($\underline{x}_L^p > \bar{x}_R^p$)

Proposition

When polarization is low and favoritism is high, both parties implement the same policy regardless of the status quo. Formally, if $\bar{x}_R^p < \underline{x}_L^p$, then a strategy profile (σ_L, σ_R) is an equilibrium strategy profile if and only if there exists $\alpha \in [\bar{x}_R^p, \underline{x}_L^p]$ such that

$$\sigma_L(x) = \sigma_R(x) = \alpha \quad \forall x.$$

There are multiple equilibria.

Possible inefficiency due to an *overshooting* or an *undershooting* effect.

But efficient equilibria always exists.

Low favoritism and low polarization

Proposition

If $\bar{x}_R^p \geq \underline{x}_L^p$ and $\bar{x}_L^m \geq \underline{x}_R^m$, then all equilibrium allocations are efficient in the long run.

At the extreme, when there is no polarization, there is a unique equilibrium. Equilibrium strategies are identical to dictator policies.

Summary

<table>
<tr><td colspan="2"></td><td colspan="2">Favoritism</td></tr>
<tr><td colspan="2"></td><td>Low</td><td>High</td></tr>
<tr><td rowspan="2">Polarization</td><td>Low</td><td>Efficient</td><td>Potential inefficiency (overshooting/undershooting)</td></tr>
<tr><td>High</td><td colspan="2">Inefficient (policy reversals)</td></tr>
</table>

Sources of inefficiency

High polarization

As the costs of policy change goes to zero, high polarization is the relevant case.

One way to prevent inefficiency is to increase the costs of policy change.

Institutions such as supermajority rules and checks and balances can reduce inefficiency.

High favoritism

Potentially inefficient equilibria

But efficient equilibria also exists.

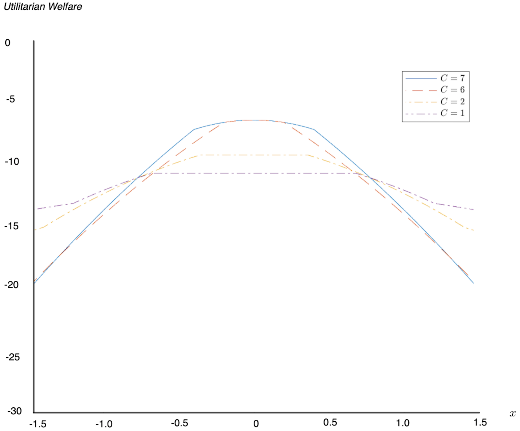
Implications

When the cost of policy change is sufficiently small:

- If the initial status quo policy is moderate, then any increase in the cost of policy change increases welfare.
- An increase in favoritism results in larger fluctuations in equilibrium policies and reduces welfare.

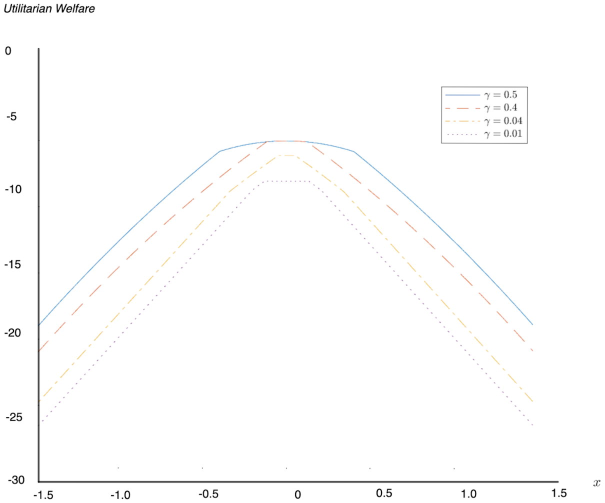
Example: Welfare (weakly) increases as costs increase when the initial policy is moderate

$\delta = 0.6$, $\gamma = 0.5$, $p = 0.8$, $u_L(x) = -0.5(x-1)^2$, $u_R(x) = 0.5(x+1)^2$.



Example: Welfare (weakly) decreases as favoritism increases

$\delta = 0.6$, $C = 5$, $p = 0.8$, $u_L(x) = -0.5(x-1)^2$, $u_R(x) = 0.5(x+1)^2$.



Extensions

Free riding effect when $c > c'$

Convex costs

Endogenous turnover

Weak political power / bargaining over policy

Weak political power