On the Faustian Dynamics of Policy and Political Power

Jinhui Bai and Roger Lagunoff

May, 2008

The "Faustian Bargain"

The “Faustian Bargain”

In Goethe’s Faust, A well meaning Faust seeks truth and beauty but cannot achieve them on his own.

The "Faustian Bargain"

In Goethe's Faust, A well meaning Faust seeks truth and beauty but cannot achieve them on his own.

The devil strikes a bargain with Faust: the devil will serve Faust while Faust remains here on earth; in exchange Faust must serve the devil in hell.

As a part of the agreement, if Faust is so happy with the devil's services that he wants to stay in that moment forever, he then must die instantly.

The "Faustian Bargain" **in Politics**

The "Faustian Bargain" **in Politics**

If a political leader chooses to meet his policy objectives, then he sacrifices future political power (and future policy objectives) for himself or his party;

If, on the other hand, the leader sells out his policy objectives in order to preserve political power, he then faces the same dilemma in the future....

Hence, he can never achieve his objectives as long as he remains in power.

Examples of *Possible* Faustian Trade-offs

1. **Limited government vs tax cuts**

   " The conservative movement is in no position to accept or even acknowledge those implications [of a recent study showing tax cuts lead to higher spending], now that tax cutting has become the long pole in the Republican tent. Therein lies the element of tragedy. By turning a limited-government movement into an anti-tax movement, conservatism has effectively gone into business with the Big Government that it claims to oppose." (Rauch, 2006)

2. Pro vs anti-immigration

"There is an element of irony in the loss of political representation suffered by Michigan and Ohio [due to immigration] in particular, because Senators Spencer Abraham (R-Mich.) and Mike DeWine (R-Ohio) are two of the most passionate proponents of high immigration in Congress. ... as our estimates make clear, their support for high immigration is not in the longer-term political interests of their respective states." (Poston, et. al. 1998).

3. Free trade vs protection

"In May of 1846, a British Parliament consisting predominantly of landowners decided to forego protection for agriculture by repealing the famous Corn Laws, a decision that split the Conservative party for a generation. Within a month of gaining repeal, the Peel Government fell and the Conservatives remained divided and for the most part out of office for decades to come." (Schonhardt-Bailey (2002))

What we do

1. Dynamic model of the Faustian trade-off.

$$\text{Policy in } \mathbf{t} \longrightarrow \text{Political Power in } \mathbf{t+1}$$

What we do

1. Dynamic model of the Faustian trade-off.

   $$\text{Policy in } \mathbf{t} \longrightarrow \text{Political Power in } \mathbf{t+1}$$

2. "Detail free" approach: examine in reduced form a class political systems that map from states to pivotal decision makers or *leaders* from a population of policy motivated citizens. The leader is endowed with authority to choose a public policy.

What we do

1. Dynamic model of the Faustian trade-off.

$$\text{Policy in } \mathbf{t} \longrightarrow \text{Political Power in } \mathbf{t+1}$$

2. "Detail free" approach: examine in reduced form a class political systems that map from states to pivotal decision makers or *leaders* from a population of policy motivated citizens. The leader is endowed with authority to choose a public policy.

3. Policy-Endogenous (PE) Political Power: current leader's policy determines a future state (e.g., summary statistic of voter characteristics) that, in turn, determines identity of leader in $\mathbf{t+1}$. (a link from policy to power).

What we do

1. Dynamic model of the Faustian trade-off.

   $$\text{Policy in } \mathbf{t} \longrightarrow \text{Political Power in } \mathbf{t+1}$$

2. "Detail free" approach: examine in reduced form a class political systems that map from states to pivotal decision makers or *leaders* from a population of policy motivated citizens. The leader is endowed with authority to choose a public policy.

3. Policy-Endogenous (PE) Political Power: current leader's policy determines a future state (e.g., summary statistic of voter characteristics) that, in turn, determines identity of leader in $\mathbf{t+1}$. (a link from policy to power).

4. Compare Policy-endogenous eq in a given political system, then compare across systems, first in a stylized, parametric model of public capital, and then in a general, non-parametric model.

Results

Results

- Faustian trade off turns political actors into *Burkean conservatives*.

Results

- Faustian trade off turns political actors into *Burkean conservatives*.
- *Reinforcing bias* $\Rightarrow$ Monotone Faustian Dynamics.

Results

- Faustian trade off turns political actors into *Burkean conservatives*.
- *Reinforcing bias* $\Rightarrow$ Monotone Faustian Dynamics.
- *Countervailing bias* $\Rightarrow$ Cyclical Faustian Dynamics.

Results

- Faustian trade off turns political actors into *Burkean conservatives*.
- *Reinforcing bias* $\Rightarrow$ Monotone Faustian Dynamics.
- *Countervailing bias* $\Rightarrow$ Cyclical Faustian Dynamics.
- Institutional Comparison. *Less biased* political systems lead to *faster* evolution of political power in the short run, but *more gradual* evolution of power in the long run.

Results

- Faustian trade off turns political actors into *Burkean conservatives*.
- *Reinforcing bias* $\Rightarrow$ Monotone Faustian Dynamics.
- *Countervailing bias* $\Rightarrow$ Cyclical Faustian Dynamics.
- Institutional Comparison. *Less biased* political systems lead to *faster* evolution of political power in the short run, but *more gradual* evolution of power in the long run.
- **In general model**, Euler Decomposition of Faustian motives into two rationales: the "political preservation effect" vs "reformation effect."

Outline of Talk

1. Basic Model.
2. Brief Lit. Review.
3. Results of canonical (parametric) model.
4. Results of general (non-parametric) model.

Basic Environment

- Citizen-types. $\mathbf{i} \in \mathbf{I} = [0, 1]$

Basic Environment

- Citizen-types. $\mathbf{i} \in \mathbf{I} = [0, 1]$
- The state $\boldsymbol{\omega}_\mathbf{t} \in \boldsymbol{\Omega}$. e.g., public capital or income distrib.

Basic Environment

- Citizen-types. $\mathbf{i} \in \mathbf{I} = [0, 1]$
- The state $\boldsymbol{\omega}_\mathbf{t} \in \boldsymbol{\Omega}$. e.g., public capital or income distrib.
- Policy $\mathbf{a}_\mathbf{t} \in \mathbf{A}$ e.g., public investment/tax.

Basic Environment

- Citizen-types. $\mathbf{i} \in \mathbf{I} = [0,1]$
- The state $\boldsymbol{\omega}_\mathbf{t} \in \boldsymbol{\Omega}$. e.g., public capital or income distrib.
- Policy $\mathbf{a_t} \in \mathbf{A}$ e.g., public investment/tax.
- Payoffs $\sum_{\mathbf{t}=0}^{\infty} \delta^{\mathbf{t}} \mathbf{u}(\mathbf{i}, \omega_\mathbf{t}, \mathbf{a_t})$

Basic Environment

- Citizen-types. $\mathbf{i} \in \mathbf{I} = [0, 1]$
- The state $\omega_t \in \Omega$. e.g., public capital or income distrib.
- Policy $\mathbf{a_t} \in \mathbf{A}$ e.g., public investment/tax.
- Payoffs $\sum_{t=0}^{\infty} \delta^t u(i, \omega_t, a_t)$
- Transition law $\omega_{t+1} = Q(\omega_t, a_t)$. No shocks.

Basic Environment

- Citizen-types. $\mathbf{i} \in \mathbf{I} = [0, 1]$
- The state $\omega_t \in \Omega$. e.g., public capital or income distrib.
- Policy $\mathbf{a_t} \in \mathbf{A}$ e.g., public investment/tax.
- Payoffs $\sum_{t=0}^{\infty} \delta^t \mathbf{u}(\mathbf{i}, \omega_t, \mathbf{a_t})$
- Transition law $\omega_{t+1} = \mathbf{Q}(\omega_t, \mathbf{a_t})$. No shocks.
- **u**, **Q** concave. **u** is $\uparrow \omega$ $\downarrow$ **a**. **Q** is $\uparrow \omega$ $\uparrow$ **a**

To fix ideas... a parametric model.

To fix ideas... a parametric model.

- One unit of time endowment split between private labor effort $\boldsymbol{\ell_{it}}$ and public sector service obligation $\mathbf{a_t}$ (e.g., military service).

To fix ideas... a parametric model.

- One unit of time endowment split between private labor effort ℓ_{it} and public sector service obligation $\mathbf{a_t}$ (e.g., military service).

- ω_t = public capital (defense, infrastructure)

$$\omega_{t+1} \; = \; Q(\omega_t, a_t) \; = \; \omega_t(1-d) \; + \; a_t, \quad 0 < d \leq 1.$$

To fix ideas... a parametric model.

- One unit of time endowment split between private labor effort $\boldsymbol{\ell_{it}}$ and public sector service obligation $\mathbf{a_t}$ (e.g., military service).

- $\boldsymbol{\omega_t} =$ public capital (defense, infrastructure)

$$\omega_{t+1} = Q(\omega_t, a_t) = \omega_t(1-d) + a_t, \quad 0 < d \leq 1.$$

- $\tilde{u}\,(i, c_{it}, a_t, \ell_{it}) = c_{it} - \frac{\ell_{it}^{1+\frac{1}{\varepsilon}}}{1+\frac{1}{\varepsilon}} - \frac{1}{f(i)}\frac{a_t^2}{2}, \quad f' > 0.$

To fix ideas... a parametric model.

- One unit of time endowment split between private labor effort ℓ_{it} and public sector service obligation $\mathbf{a_t}$ (e.g., military service).

- ω_t = public capital (defense, infrastructure)

$$\omega_{t+1} = Q(\omega_t, a_t) = \omega_t(1-d) + a_t, \quad 0 < d \leq 1.$$

- $\tilde{u}(i, c_{it}, a_t, \ell_{it}) = c_{it} - \frac{\ell_{it}^{1+\frac{1}{\varepsilon}}}{1+\frac{1}{\varepsilon}} - \frac{1}{f(i)}\frac{a_t^2}{2}, \quad f' > 0.$

- $\mathbf{i}$'s income/wealth. $y(i, \ell_{it}, \omega_t) = g(i)\,\ell_{it} + \omega_t.$

Solving citizens' private sector labor decisions gives sol'n $\ell^*(\mathbf{i}, \omega)$ (similar to Battaglini and Coate, 2007).

... produces an indirect payoff fnc.

$$\mathbf{u(i, \omega_t, a_t) \quad = \quad f(i)\ \omega_t - \frac{a_t^2}{2}}$$

Higher type $\mathbf{i} =$ more "fiscally liberal" decision maker

Political Power

- Political power determined by type of the "leader"

$$\mathbf{i_t} = \mu(\omega_\mathbf{t})$$

Political Power

- Political power determined by type of the "leader"

$$\mathbf{i_t} = \mu(\omega_\mathbf{t})$$

- μ determines "who's in charge" in each state - the *authority function*.

Political Power

- Political power determined by type of the "leader"

$$\mathbf{i_t} = \mu(\omega_t)$$

- μ determines "who's in charge" in each state - the *authority function*.

- Benchmark case: $\mu(\omega_t) = \mathbf{i_0}$ for all ω_t, referred to as the "Permanent authority" (PA) regime.

Where does μ come from?

This paper - μ exogenous.

However,.... example of μ derived from a voting rule.

Parametric model with **wealth-weighted voting**: $\mathbf{a_t} =$ Condorcet Winning policy when each $\mathbf{i}$ allocated $\mathbf{y(i, \ell, \omega)}$ votes.

Where does μ come from?

This paper - μ exogenous.

However,.... example of μ derived from a voting rule.

Parametric model with **wealth-weighted voting**: $\mathbf{a_t} =$ Condorcet Winning policy when each $\mathbf{i}$ allocated $\mathbf{y(i, \ell, \omega)}$ votes.

Then μ endogenously determined by the Lorenz fnct

$$\frac{\int_{\mu(\omega)}^{1} \mathbf{y(j, \ell^*(j, \omega), \omega) dj}}{\int_0^1 \mathbf{y(j, \ell^*(j, \omega), \omega) dj}} = \frac{1}{2}$$

Permanent Authority (PA) Regime: $\mu(\omega_t) = i_0$

Permanent Authority (PA) Regime: $\mu(\omega_t) = \mathbf{i_0}$

$\mathbf{i_0}$'s *policy rule*: $\psi(\omega_t) = \mathbf{a_t}$.

Permanent Authority (PA) Regime: $\mu(\omega_t) = i_0$

i_0's *policy rule*: $\psi(\omega_t) = a_t$.

Permanent Authority (PA) solution: ψ solves

$$V(i_0, \omega_t;\ \psi) \;=\; \max_{a_t \in A} \left[u(i_0, \omega_t, a_t) \;+\; \delta\, V(i_0, Q(\omega_t, a_t);\ \psi)\right]$$

** A completely standard DP problem!

Policy-Endogenous (PE) Regime: $\mu(\omega_t) = i_t$

Policy-Endogenous (PE) Regime: $\mu(\omega_t) = \mathbf{i}_t$

$$\mathbf{\Psi}(\mathbf{i}, \omega_t) = \mathbf{a}_t \quad \text{and} \quad \mathbf{\Psi}^*(\omega_t) = \mathbf{\Psi}(\mu(\omega_t), \omega_t)$$

Policy-Endogenous (PE) Regime: $\mu(\omega_t) = \mathbf{i}_t$

$$\Psi(\mathbf{i}, \omega_t) = \mathbf{a}_t \quad \text{and} \quad \Psi^*(\omega_t) \;=\; \Psi(\mu(\omega_t), \omega_t)$$

$$\mathbf{V}(\mathbf{i}, \omega_t;\; \Psi^*) \;=\; \sum_{\tau=t}^{\infty} \delta^{\tau-t}\, \mathbf{u}(\mathbf{i}, \omega_\tau, \Psi^*(\omega_\tau))$$

Policy-Endogenous (PE) Regime: $\mu(\omega_t) = \mathbf{i}_t$

$$\Psi(\mathbf{i}, \omega_t) = \mathbf{a}_t \quad \text{and} \quad \Psi^*(\omega_t) = \Psi(\mu(\omega_t), \omega_t)$$

$$\mathbf{V}(\mathbf{i}, \omega_t;\ \Psi^*) = \sum_{\tau=t}^{\infty} \delta^{\tau-t}\, \mathbf{u}(\mathbf{i}, \omega_\tau, \Psi^*(\omega_\tau))$$

A Policy-Endogenous (PE) Markov Perfect Equilibrium

$$\mathbf{V}(\mu(\omega_t), \omega_t;\ \Psi^*) \geq \mathbf{u}(\mu(\omega_t), \omega_t, \mathbf{a}_t) + \delta\, \mathbf{V}(\mu(\omega_t), \mathbf{Q}(\omega_t, \mathbf{a}_t);\ \Psi^*)$$

for all ω_t and all $\mathbf{a}_t$.

$\mathbf{i_0}$

$\mathbf{a_0}$

$\uparrow$

$\mathbf{i_0}$

$\mathbf{a_0} \quad \longrightarrow \quad \omega_1$

$\uparrow$

$\mathbf{i_0}$

$$\begin{array}{ccc} \mathbf{a}_0 & \longrightarrow & \omega_1 \\ \uparrow & & \downarrow \\ \mathbf{i}_0 & & \mathbf{i}_1 \end{array}$$

$$\begin{array}{ccccc} \mathbf{a}_0 & \longrightarrow & \omega_1 & & \\ \uparrow & & \downarrow & & \\ \mathbf{i}_0 & & \mathbf{i}_1 & \mathbf{i}_2 \quad \mathbf{i}_3 & \mathbf{i}_4 \end{array}$$

$$\begin{array}{ccccccccc} \mathbf{a_0} & \longrightarrow & \omega_1 & & & & & & \\ \uparrow & & \downarrow & & & & & & \\ \mathbf{i_0} & & \mathbf{i_1} & & \mathbf{i_2} & & \mathbf{i_3} & & \mathbf{i_4} \end{array}$$

Monotone Faustian Dynamics

$\mathbf{i_0}$ $\mathbf{i_1}$ $\mathbf{i_2}$ $\mathbf{i_3}$ $\mathbf{i_4}$

Cyclical Faustian Dynamics

What other questions should be asked of the Faustian model?

- **Policy comparison**. $\overbrace{\boldsymbol{\Psi^*(\omega_t)}}^{\textbf{PE}}$ vs $\overbrace{\boldsymbol{\psi(\omega_t)}}^{\textbf{PA}}$.

What other questions should be asked of the Faustian model?

- **Policy comparison.** $\overbrace{\boldsymbol{\Psi^*(\omega_t)}}^{\textbf{PE}}$ vs $\overbrace{\boldsymbol{\psi(\omega_t)}}^{\textbf{PA}}$.

- **"Hypothetical" policy comparison.** $\overbrace{\boldsymbol{\Psi(i_0, \omega_t)}}^{\textbf{PE}}$ vs $\overbrace{\boldsymbol{\psi(\omega_t)}}^{\textbf{PA}}$.

What other questions should be asked of the Faustian model?

- **Policy comparison**. $\overbrace{\Psi^*(\omega_t)}^{\text{PE}}$ vs $\overbrace{\psi(\omega_t)}^{\text{PA}}$.

- **"Hypothetical" policy comparison**. $\overbrace{\Psi(i_0, \omega_t)}^{\text{PE}}$ vs $\overbrace{\psi(\omega_t)}^{\text{PA}}$.

- **Comparing two different PE regimes**. μ^2 vs μ^1.

Literature

- **Dynamically Inconsistent Policy**. Harris and Laibson (2001), Krusell, Kuruscu, & Smith (2002), Judd (2003).
- **Un-Coupled Institutional choice**. Acemoglu and Robinson (2000, 2001, 2005, 2006), Jack and Lagunoff (2006), Cervelatti, et. al. (2006), Lagunoff (2006), Coate and Morris (1999), Person and Tabellini (2007).
- **Policy-Endogenous Mechanisms** Hassler, et. al. (2003,2005), Ortega (2005), Azzimonti (2005), & Campante (2007).

Returning to the parametric model...

Let $\mathbf{i_t} \;=\; \mu(\omega_t) \;\equiv\; \mathbf{f}^{-1}(\kappa_0 + \kappa\omega_t), \quad \kappa_0 > \mathbf{0}$.

Returning to the parametric model...

Let $\mathbf{i_t} \; = \; \mu(\omega_t) \; \equiv \; \mathbf{f}^{-1}(\kappa_0 + \kappa\omega_t), \quad \kappa_0 > 0$.

- If $\kappa > 0$ then μ increasing - *reinforcing political bias*.

Returning to the parametric model...

Let $\mathbf{i_t} = \mu(\omega_\mathbf{t}) \equiv \mathbf{f^{-1}}(\kappa_\mathbf{0} + \kappa\omega_\mathbf{t}), \quad \kappa_\mathbf{0} > \mathbf{0}$.

- If $\kappa > \mathbf{0}$ then μ increasing - *reinforcing political bias*.
- If $\kappa < \mathbf{0}$ then μ decreasing - *countervailing bias*.

Returning to the parametric model...

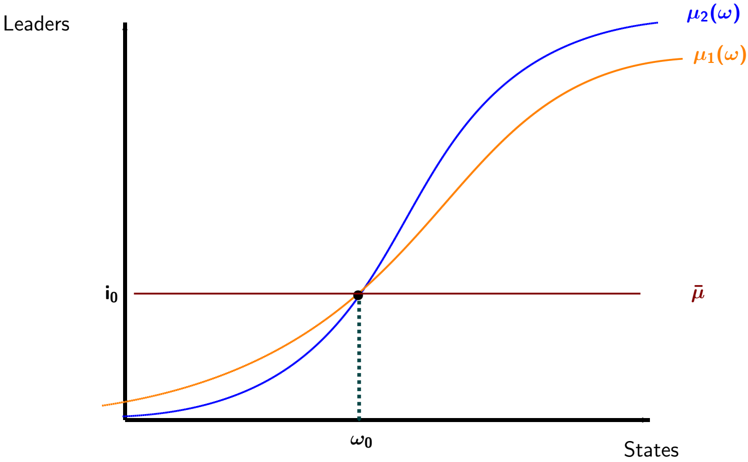
Let $\mathbf{i_t} = \mu(\omega_\mathbf{t}) \equiv \mathbf{f}^{-1}(\kappa_0 + \kappa\omega_\mathbf{t}), \quad \kappa_0 > \mathbf{0}$.

- If $\kappa > \mathbf{0}$ then μ increasing - *reinforcing political bias*.
- If $\kappa < \mathbf{0}$ then μ decreasing - *countervailing bias*.
- Political bias increasing in $|\kappa|$: Structural change is more gradual the smaller is $|\kappa|$. $\kappa = \mathbf{0}$ corresponds to Permanent authority (PA).

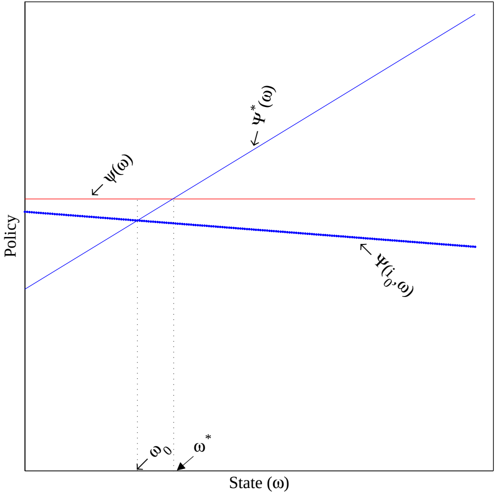
comparison

Differing degrees of bias

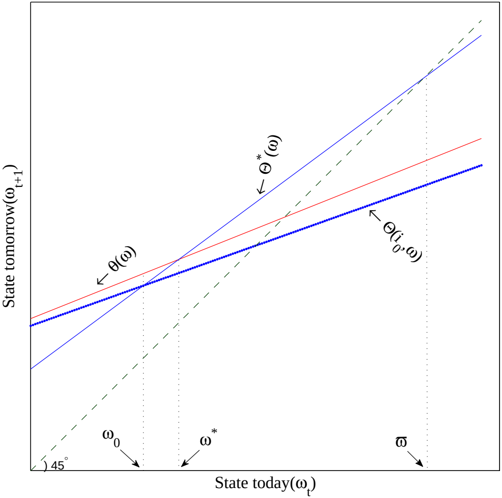
▸ parametric



Policy Comparisons under Monotone Faustian Dynamics



State Transitions



Proposition. Monotone Faustian Dynamics

If $\kappa > \mathbf{0}$ is not too large, then there exist unique $\mathbf{\Psi}^*$, $\mathbf{\Psi}$, & ψ s.t.

1. $\mathbf{\Psi}^*(\omega_\mathbf{t})$ increasing, $\mathbf{\Psi}(\mathbf{i_0}, \omega_\mathbf{t})$ decreasing in $\omega_\mathbf{t}$, and $\psi(\omega_\mathbf{t})$ is stationary.

Proposition. Monotone Faustian Dynamics

If $\kappa > \mathbf{0}$ is not too large, then there exist unique $\boldsymbol{\Psi}^*$, $\boldsymbol{\Psi}$, & ψ s.t.

1. $\boldsymbol{\Psi}^*(\boldsymbol{\omega_t})$ increasing, $\boldsymbol{\Psi}(\mathbf{i_0}, \boldsymbol{\omega_t})$ decreasing in $\boldsymbol{\omega_t}$, and $\psi(\boldsymbol{\omega_t})$ is stationary.

2. PE eqm path $\{\boldsymbol{\omega_t}\}$ converges to a unique steady state $\bar{\boldsymbol{\omega}}$, and for $\boldsymbol{\omega_0} < \boldsymbol{\omega_t} \leq \bar{\boldsymbol{\omega}}$, then $\boldsymbol{\Psi}(\mathbf{i_0}, \boldsymbol{\omega_t}) < \psi(\boldsymbol{\omega_t})$ and $\boldsymbol{\Psi}(\mathbf{i_0}, \boldsymbol{\omega_t}) < \boldsymbol{\Psi}^*(\boldsymbol{\omega_t})$. (Hypothetical PE is more conservative than either PA or PE eqm.).

Proposition. Monotone Faustian Dynamics

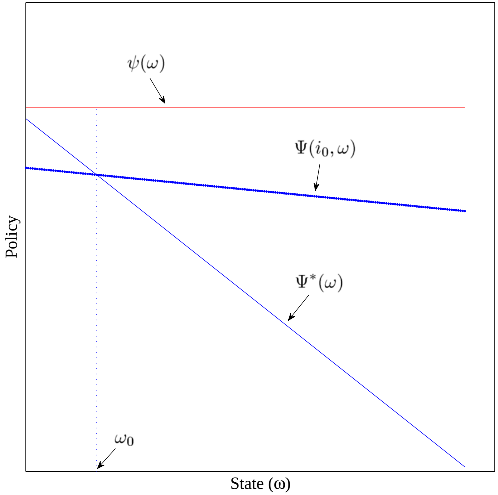
If $\kappa > \mathbf{0}$ is not too large, then there exist unique $\mathbf{\Psi}^*$, $\mathbf{\Psi}$, & ψ s.t.

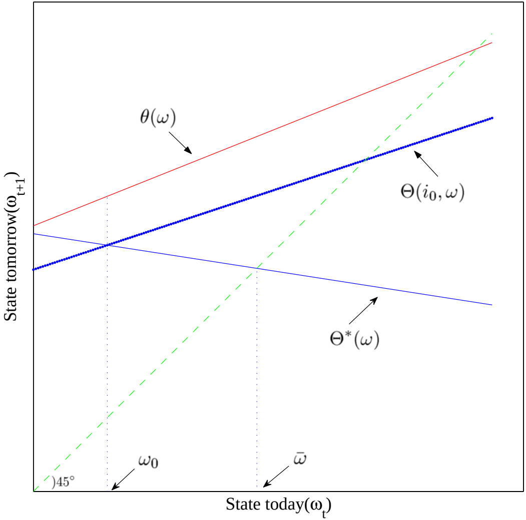
1. $\mathbf{\Psi}^*(\omega_t)$ increasing, $\mathbf{\Psi}(\mathbf{i_0}, \omega_t)$ decreasing in ω_t, and $\psi(\omega_t)$ is stationary.
2. PE eqm path $\{\omega_t\}$ converges to a unique steady state $\bar{\omega}$, and for $\omega_0 < \omega_t \leq \bar{\omega}$, then $\mathbf{\Psi}(\mathbf{i_0}, \omega_t) < \psi(\omega_t)$ and $\mathbf{\Psi}(\mathbf{i_0}, \omega_t) < \mathbf{\Psi}^*(\omega_t)$. (Hypothetical PE is more conservative than either PA or PE eqm.).
3. For each ω_0 there exists a "cutoff" state ω^* s.t.

$$\begin{array}{lcll} \mathbf{\Psi}^*(\omega_t) & < & \psi(\omega_t) & \forall \omega_t < \omega^* \\ \mathbf{\Psi}^*(\omega_t) & \geq & \psi(\omega_t) & \forall \omega_t \geq \omega^* \end{array}$$

(PE eqm starts out more conservative than PA, but is more progressive in long run).

Policy Comparisons under Cyclical Faustian Dynamics





$\theta(\omega)$
$\Theta(i_0, \omega)$
$\Theta^*(\omega)$
ω_0
$\bar{\omega}$
)45°
State tomorrow(ω_{t+1})
State today(ω_t)

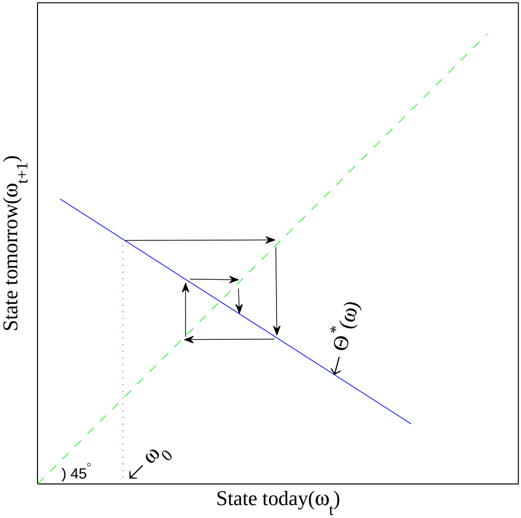


Figure: Cycles with Countervailing Bias

Proposition. Cyclical Faustian Dynamics

Suppose $\boldsymbol{\kappa} < -\frac{\mathbf{1-d}}{\boldsymbol{\delta}}$ (strong countervailing bias). Then for $|\boldsymbol{\kappa}|$ not too large there exist unique $\boldsymbol{\Psi}^*$, $\boldsymbol{\Psi}$, & ψ s.t.

1. $\boldsymbol{\Psi}^*$ and $\boldsymbol{\Psi}$ are decreasing in $\boldsymbol{\omega}_{\mathbf{t}}$. ψ is stationary.

Proposition. Cyclical Faustian Dynamics

Suppose $\kappa < -\frac{\mathbf{1-d}}{\boldsymbol{\delta}}$ (strong countervailing bias). Then for $|\boldsymbol{\kappa}|$ not too large there exist unique $\boldsymbol{\Psi}^*$, $\boldsymbol{\Psi}$, & ψ s.t.

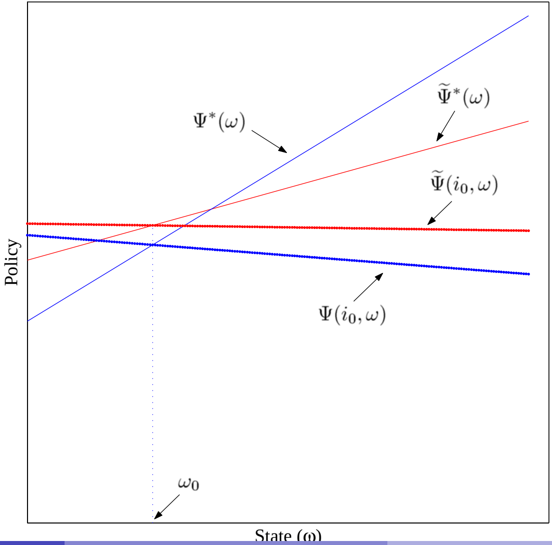
1. $\boldsymbol{\Psi}^*$ and $\boldsymbol{\Psi}$ are decreasing in $\boldsymbol{\omega_t}$. ψ is stationary.
2. The PE equilibrium path of states $\{\boldsymbol{\omega_t}\}$ converges to a unique steady state $\bar{\boldsymbol{\omega}}$. Then the economy follows a dampened cycle converging to $\bar{\boldsymbol{\omega}}$ such that $\boldsymbol{\omega_t} < \bar{\boldsymbol{\omega}}$ if and only if $\boldsymbol{\omega_{t+1}} > \bar{\boldsymbol{\omega}}$.

Proposition. Cyclical Faustian Dynamics

Suppose $\kappa < -\frac{1-d}{\delta}$ (strong countervailing bias). Then for $|\kappa|$ not too large there exist unique Ψ^*, Ψ, & ψ s.t.

1. Ψ^* and Ψ are decreasing in ω_t. ψ is stationary.
2. The PE equilibrium path of states $\{\omega_t\}$ converges to a unique steady state $\bar{\omega}$. Then the economy follows a dampened cycle converging to $\bar{\omega}$ such that $\omega_t < \bar{\omega}$ if and only if $\omega_{t+1} > \bar{\omega}$.
3. $\Psi^*(\omega_0) = \Psi(i_0, \omega_0) < \psi(\omega_0) \quad \forall \omega_0 \leq \bar{\omega}$, and
   $\Psi^*(\omega_0) = \Psi(i_0, \omega_0) > \psi(\omega_0) \quad \forall \omega_0 > \bar{\omega}$.
   ("Liberal" types are more conservative than they would be under PA. But "conservative" types are more liberal than they would be under PA.).

Comparison of Political Institutions



Proposition. Comparison of Political Institutions

Consider two authority rules, μ^1 and μ^2 such that $\mu^1(\omega) < \mu^2(\omega)$ for all ω. Then there exists a state ω^* with $\omega_0 < \omega^* < \bar{\omega}$ such that

$$\begin{array}{lcll} \Psi^{*2}(\omega_t) & < & \Psi^{*1}(\omega_t) & \forall \omega_t < \omega^* \\ \Psi^{*2}(\omega_t) & \geq & \Psi^{*1}(\omega_t) & \forall \omega_t \geq \omega^* \end{array}$$

More biased political institution yields...
lower investment, smaller govt., more conservative leaders in the short run,
higher investment, larger govt., & more progressive leaders in the long run.

General Model

Smooth-limit PE equilibria.

(i) SPM assumptions on $\mathbf{u}$ and $\mathbf{Q}$.

(ii) $\boldsymbol{\Psi}^*(\boldsymbol{\omega_t})$ and $\psi(\boldsymbol{\omega_t})$ are smooth and lie in the interior of the feasible policy space, $\mathbf{A}$.

(iii) $\boldsymbol{\Psi}^*$ and ψ are the limits of smooth finite horizon PE and PA eq.

The Distortion function

The Distortion function

Marginal payoff deviation from **i**'s own preferred policy.

$$\mathbf{\Delta}^*(\mathbf{i}, \omega_t) \quad =$$

$$\mathbf{D}_{\mathbf{a}_t}\mathbf{u}(\mathbf{i}, \omega_t, \mathbf{\Psi}^*(\omega_t)) \; + \; \delta \, \mathbf{D}_{\mathbf{a}_t}\mathbf{Q}(\omega_t, \mathbf{\Psi}^*(\omega_t)) \cdot \mathbf{D}_{\omega_{t+1}}\mathbf{V}(\mathbf{i}, \omega_{t+1}; \; \mathbf{\Psi}^*)$$

The Distortion function

Marginal payoff deviation from **i**'s own preferred policy.

$$\mathbf{\Delta^*(i, \omega_t)} \;=$$

$$\mathbf{D_{a_t} u(i, \omega_t, \Psi^*(\omega_t))} \;+\; \delta\, \mathbf{D_{a_t} Q(\omega_t, \Psi^*(\omega_t)) \cdot D_{\omega_{t+1}} V(i, \omega_{t+1};\; \Psi^*)}$$

$\mathbf{\Delta^*(i_t, \omega_t) = 0}$ by def'n of PE eqm (but $\neq \mathbf{0}$ if $\mathbf{i} \neq \mathbf{i_t}$).

No distortion under PA.

Distortion-adjusted Euler equation

$$\mathbf{D_{a_t} u_{i_t} + \delta\ D_{a_t} Q \cdot [R(i_t, \omega_{t+1};\ \Psi^*)\ +\ P(i_t, \omega_{t+1}; \Psi^*)]\ =\ 0}$$

where

Distortion-adjusted Euler equation

$$\mathbf{D_{a_t} u_{i_t} + \delta\, D_{a_t} Q \cdot [R(i_t, \omega_{t+1};\ \Psi^*) \ +\ P(i_t, \omega_{t+1}; \Psi^*)] \ = \ 0}$$

where

- $\mathbf{R(i_t, \omega_{t+1}; \Psi^*) \equiv \overbrace{D_{\omega_{t+1}} u_{i_t} \ +\ D_{\omega_{t+1}} L \ \cdot\ D_{a_{t+1}} u_{i_t}}^{\text{direct marginal impact on payoff next per.}}}$

Distortion-adjusted Euler equation

$$\mathbf{D_{a_t} u_{i_t}} + \delta\ \mathbf{D_{a_t} Q} \cdot [\mathbf{R}(\mathbf{i_t}, \omega_{t+1};\ \mathbf{\Psi^*}) + \mathbf{P}(\mathbf{i_t}, \omega_{t+1}; \mathbf{\Psi^*})] = 0$$

where

- $\mathbf{R}(\mathbf{i_t}, \omega_{t+1}; \mathbf{\Psi^*}) \equiv \overbrace{\mathbf{D}_{\omega_{t+1}} \mathbf{u_{i_t}} + \mathbf{D}_{\omega_{t+1}} \mathbf{L} \cdot \mathbf{D_{a_{t+1}} u_{i_t}}}^{\text{direct marginal impact on payoff next per.}}$

- $\mathbf{P}(\mathbf{i_t}, \omega_{t+1}; \mathbf{\Psi^*}) \equiv \overbrace{\mathbf{D}_{\omega_{t+1}} \mathbf{\Theta^*} \cdot \mathbf{D}_{\omega_{t+2}} \mathbf{L} \cdot \mathbf{\Delta^*}(\mathbf{i_t}, \omega_{t+1})}^{\text{indirect marginal impact on all future political types}}$

where $\omega_{t+1} = \mathbf{Q}(\omega_t, \mathbf{\Psi^*}(\omega_t)) \equiv \overbrace{\mathbf{\Theta^*}(\omega_t)}^{\text{eqm transition rule}}$

Faustian Motives — A Decomposition

$$\overbrace{\mathbf{R}(\mathbf{i_0}, \omega_\mathbf{t};\ \boldsymbol{\Psi}^*)\ -\ \mathbf{R}(\mathbf{i}, \omega_\mathbf{t}; \psi)}^{\text{Reformation Effect}}$$

Faustian Motives — A Decomposition

$$\overbrace{\mathbf{R}(\mathbf{i_0}, \omega_\mathbf{t};\ \mathbf{\Psi^*})\ -\ \mathbf{R}(\mathbf{i}, \omega_\mathbf{t}; \psi)}^{\text{Reformation Effect}}$$

$$\overbrace{\mathbf{P}(\mathbf{i_0}, \omega_\mathbf{t};\ \mathbf{\Psi^*})}^{\text{Preservation Effect}}$$

Theorem

Let $\mathbf{\Psi}^*$ be a smooth-limit PE eq. and $\mathbf{\Theta}^*$ the induced transition rule.

Theorem

Let $\boldsymbol{\Psi}^*$ be a smooth-limit PE eq. and $\boldsymbol{\Theta}^*$ the induced transition rule.

1. Then $\boldsymbol{\Theta}^*$ is weakly increasing in the state $\boldsymbol{\omega_t}$.

Theorem

Let $\boldsymbol{\Psi}^*$ be a smooth-limit PE eq. and $\boldsymbol{\Theta}^*$ the induced transition rule.

1. Then $\boldsymbol{\Theta}^*$ is weakly increasing in the state $\boldsymbol{\omega_t}$.

2. if $\boldsymbol{\Theta}^*(\omega_0) > \omega_0$, then

$$\mathbf{P}(\mathbf{i_t}, \omega_{\mathbf{t+1}};\ \boldsymbol{\Psi}^*) \ < \ \mathbf{0} \quad \forall \mathbf{t}$$

The political preservation effect is negative;

Theorem

Let $\boldsymbol{\Psi}^*$ be a smooth-limit PE eq. and $\boldsymbol{\Theta}^*$ the induced transition rule.

1. Then $\boldsymbol{\Theta}^*$ is weakly increasing in the state $\boldsymbol{\omega_t}$.
2. if $\boldsymbol{\Theta}^*(\omega_0) > \omega_0$, then

$$\mathbf{P}(\mathbf{i_t}, \omega_{t+1};\ \boldsymbol{\Psi}^*) \ < \ \mathbf{0} \quad \forall \mathbf{t}$$

   The political preservation effect is negative;
3. The PE eqm paths $\{\omega_t\}$ and $\{\mathbf{i_t}\}$ satisfy

$$\omega_{t+1} > \omega_t \ \text{ and } \ \mathbf{i_{t+1}} > \mathbf{i_t}, \quad \forall \mathbf{t}.$$

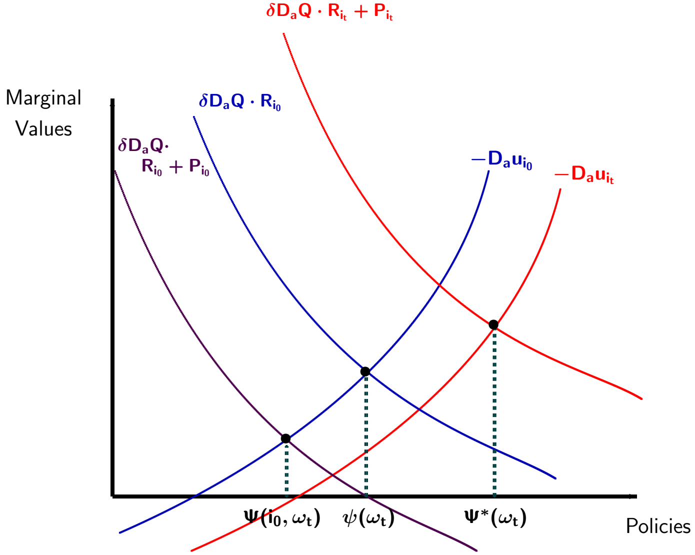
   Evolution toward more progressive political leaders.

Theorem

Let Ψ^* be a smooth-limit PE eq. and Θ^* the induced transition rule.

1. Then Θ^* is weakly increasing in the state ω_t.
2. if $\Theta^*(\omega_0) > \omega_0$, then
$$P(i_t, \omega_{t+1};\ \Psi^*) < 0 \quad \forall t$$
The political preservation effect is negative;
3. The PE eqm paths $\{\omega_t\}$ and $\{i_t\}$ satisfy
$$\omega_{t+1} > \omega_t \text{ and } i_{t+1} > i_t, \quad \forall t.$$
Evolution toward more progressive political leaders.
4. $\Psi^*(\omega_t) \geq \Psi(i_0, \omega_t)$ with str. inequality if $\omega_t > \omega_0$.
Hypothetical decision by i_0 is more conservative than policy chosen in PE eqm.

Classic Faustian compromise: $|\mathbf{P}| > \mathbf{R}$.



Conclusion

- A model of the Faustian trade-off between policy and power.
- Progressive evolution consistent with conservative individual decision making.
- Increased bias leads to faster political evolution, but only in the long run.
- Locally dfble MCS methods for solving political games.
- Things to do: Relax monotonicity and MCS. Endogenous derivation of μ.

Main idea used in the prfs

$$\mathbf{H}(\mathbf{i}, \omega_t, \mathbf{a}_t, \mathbf{U}) = \mathbf{u}(\mathbf{i}, \omega_t, \mathbf{a}_t) \; + \; \delta \mathbf{U}(\mathbf{i}, \mathbf{Q}(\omega_t, \mathbf{a}_t)) \mathbf{d}\pi(\nu')$$

$\mathbf{\Psi}(\mathbf{i}, \omega, \mathbf{U}) \in \arg\max \mathbf{H}(\mathbf{i}, \omega, \mathbf{a}, \mathbf{U})$

Main idea used in the prfs

$$\mathbf{H(i, \omega_t, a_t, U) = u(i, \omega_t, a_t) \ + \ \delta U(i, Q(\omega_t, a_t)) d\pi(\nu')}$$

$\mathbf{\Psi(i, \omega, U)} \in \arg\max \mathbf{H(i, \omega, a, U)}$

Step 1. Use Assumptions to show: If $\mathbf{U}$ has incr. diff and monotonicity properties, then $\mathbf{H(i, \omega, \Psi^*(\omega, U), U)}$ does so as well.

Main idea used in the prfs

$$\mathbf{H(i,\omega_t,a_t,U) = u(i,\omega_t,a_t)\ +\ \delta U(i,Q(\omega_t,a_t))d\pi(\nu')}$$

$\mathbf{\Psi(i,\omega,U)} \in \arg\max \mathbf{H(i,\omega,a,U)}$

Step 1. Use Assumptions to show: If $\mathbf{U}$ has incr. diff and monotonicity properties, then $\mathbf{H(i,\omega,\Psi^*(\omega,U),U)}$ does so as well.

Step 2. Use Topkis Thm $\longrightarrow$ $\mathbf{\Psi(i,\omega,U)}$ incr. in $\mathbf{i}$ & ω.

Main idea used in the prfs

$$\mathbf{H(i,\omega_t,a_t,U) = u(i,\omega_t,a_t) \ + \ \delta U(i,Q(\omega_t,a_t))d\pi(\nu')}$$

$\mathbf{\Psi(i,\omega,U)} \in \arg\max \mathbf{H(i,\omega,a,U)}$

Step 1. Use Assumptions to show: If $\mathbf{U}$ has incr. diff and monotonicity properties, then $\mathbf{H(i,\omega,\Psi^*(\omega,U),U)}$ does so as well.

Step 2. Use Topkis Thm $\longrightarrow$ $\mathbf{\Psi(i,\omega,U)}$ incr. in $\mathbf{i}$ & ω.

Step 3. Iteratively construct $\mathbf{\Psi_T}$ in $\mathbf{T}$-per. finite horizon game. Show $\mathbf{\Psi_T}$ has requisite properties.

Main idea used in the prfs

$$\mathbf{H(i,\omega_t,a_t,U) = u(i,\omega_t,a_t)\ +\ \delta U(i,Q(\omega_t,a_t))d\pi(\nu')}$$

$\mathbf{\Psi(i,\omega,U)} \in \arg\max \mathbf{H(i,\omega,a,U)}$

Step 1. Use Assumptions to show: If $\mathbf{U}$ has incr. diff and monotonicity properties, then $\mathbf{H(i,\omega,\Psi^*(\omega,U),U)}$ does so as well.

Step 2. Use Topkis Thm $\longrightarrow$ $\mathbf{\Psi(i,\omega,U)}$ incr. in $\mathbf{i}$ & ω.

Step 3. Iteratively construct $\mathbf{\Psi_T}$ in $\mathbf{T}$-per. finite horizon game. Show $\mathbf{\Psi_T}$ has requisite properties.

Step 4. Use smooth-limit property to show $\mathbf{\Psi = \lim_{T\to\infty} \Psi_T}$, has requisite properties.

Endogenous Derivation of Authority μ

Wealth-weighted voting rule: $\mathbf{a_t} =$ Condorcet Winning policy when each $\mathbf{i}$ allocated $\mathbf{y(i, \omega)}$ votes.

Endogenous Derivation of Authority μ

Wealth-weighted voting rule: $\mathbf{a_t}$ = Condorcet Winning policy when each $\mathbf{i}$ allocated $\mathbf{y(i,\omega)}$ votes.

Then μ endogenously determined by

$$\frac{\int_{\mu(\omega)}^{1} \mathbf{y(j,\omega)dj}}{\int_{0}^{1} \mathbf{y(j,\omega)dj}} = \frac{1}{2}$$

Endogenous Derivation of Authority μ

Wealth-weighted voting rule: $\mathbf{a_t} =$ Condorcet Winning policy when each $\mathbf{i}$ allocated $\mathbf{y(i, \omega)}$ votes.

Then μ endogenously determined by

$$\frac{\int_{\mu(\omega)}^{1} \mathbf{y(j, \omega)dj}}{\int_{0}^{1} \mathbf{y(j, \omega)dj}} = \frac{1}{2}$$

E.g., if $\mathbf{y(i, \omega)} = \alpha(1 - \mathbf{i}) + \omega_t$ then

$$\mu(\omega) = \frac{(\omega + \alpha) - \sqrt{\omega^2 + \alpha\omega + \frac{1}{2}\alpha^2}}{\alpha}$$

A real valued function $\mathbf{f}$ is *supermodular in the vector* $\mathbf{(x, y)}$ if for all $\mathbf{(x, y)}$,

$$\mathbf{f(x \vee y) - f(x) \leq f(y) - f(x \wedge y).}$$

back to assumptions

Proof sketches of parametric results.