Economic Policy Reform

Why are Inefficient Policies/Institutions Maintained?

Countries with sound institutions and efficiency-enhancing policies tend to be more prosperous. Yet, many LDCs have maintained inefficient institutions/policies for decades, resulting in economic stagnation, poverty, low life expectancy and high mortality and generally low welfare for the majority of their citizens. Other countries continue in inefficient and unsustainable policies until a major crisis develops: e.g. currency crises, hyperinflation, etc.

Large long-term gains could be realized if such countries reformed their institutions/policies. Why are such reforms not implemented?

Answer: reforms are typically costly in the short-term, have important distributional implications, and/or their outcome is uncertain at the individual or aggregate level.

Political Constraints

Economists often assume that policy makers are able to choose from a broad array of available policies. Policies that eventually get implemented represent a political equilibrium, which reflects economic interests of various socio-economic groups, as well as overall economic performance. Reforms, in turn, change this political equilibrium by creating *winners* and *losers*.

Political sustainability: Reform need political support ex ante (acceptability) and ex post (irreversibility). Political constraints determine what kind of reform strategy is feasible, and may have important repercussions (reform reversal, rise of nationalism, disintegration of countries, etc.).

Sequencing of reforms is important: reform may create constituencies opposing reform reversal (*virtuous cycle*), or the beneficiaries of the initial reform may oppose further reforms (*vicious cycle*; Krueger, 1993; Hellman, 1998).

Observations on reform dynamics (Rodrik, 1993, AER; Tommasi and Velasco, 1996, JPR)

1. Reforms that eventually benefit broad segments of the society are often opposed ex ante (*status quo bias*).
2. Reforms are typically implemented only after prolonged economic crisis (hyperinflation, excessive indebtedness) and hardship.
3. Once implemented, reforms are frequently radical and, besides stabilization, entail dramatic liberalization (*reform overshooting*).
4. Reforms are sometimes implemented (and maintained) by *unlikely* politicians, i.e. politicians who are in general thought to have an ideological bias against such reform.
5. Sometimes, reforms are stalled or reversed (*reform fatique* or *reform reversal*).
6. Reforming countries sometimes go through cycles—reform followed by populism followed again by more reform.

Determinants of Political Constraints

- Individual uncertainty
- Aggregate uncertainty
- Complementarities
- Reversal costs
- Credibility and information asymmetry

Individual Uncertainty

Fernandez and Rodrik (AER 1991).

A reform will be implemented if it is supported by a majority of voters. The overall distribution of gains and losses is known ex ante (no aggregate uncertainty). However, the identity of winners and losers is unknown (individual uncertainty).

An individual gains $g > 0$ with probability p and loses $l < 0$ with probability $1 - p$ (in net present value). Expected gain is

$$pg + (1 - p)l$$

and p is the fraction of *ex post* winners. Payoff of no reform (status quo) is assumed to be 0. Individuals are risk-neutral. Reform can be reversed at a cost c to everyone: $l < c < 0$ so that losers prefer reversal rather than reform.

Four possible outcomes:

1. $p > \frac{1}{2}$ and $pg + (1 - p)l > 0$: reform accepted both *ex ante* and *ex post*.
2. $p < \frac{1}{2}$ and $pg + (1 - p)l < 0$: reform rejected both *ex ante* and *ex post*.
3. $p > \frac{1}{2}$ and $pg + (1 - p)l < 0$: reform rejected *ex ante* but accepted *ex post*—shifting majority (a case for a *benevolent dictator*?).
4. $p < \frac{1}{2}$ and $pg + (1 - p)l > 0$: reform would be accepted *ex ante* but reversed *ex post*—since reversal is costly, the reform will not be implemented at all.

In the last two cases, indivudial uncertainty leads to a *status quo bias*, even though the reform is socially optimal. Because of individual uncertainty, there is a bias against implementing the reform and the inefficient status quo will be maintained.

Consider case where $p = 0.6$, $g = 10$ and $l = -8$. The ex-ante expected payoff is 2.8 but there is considerable uncertainty about it: 40% will end up as losers. As the winners are in majority and the expected payoff is positive, the reform will be implemented.

Now assume that the identity of ½ of winners is known ex ante with certainty. Hence, the share of known winners is 0.3 while in the rest of the population, there will be 0.3 winners and 0.4 losers. The expected payoff for the rest of the population now is -0.2. Only the known winners will vote for the reform ex ante while the rest of the population will oppose it.

Hence, uncertainty can lead to status-quo bias whereby efficiency enhancing reform is not implemented. However, reducing uncertainty does not necessarily help.

War of Attrition and Delayed Stabilizations

Alesina and Drazen (AER 1991).

Efficiency-enhancing stabilizations (reforms) often get delayed, thus further aggravating the severity of the crisis. The delays are often due to disagreement over sharing of the burden of adjustment: tax increases and/or spending cuts directed towards specific socio-economic groups (e.g. government revenue can be increased by raising the VAT rate or by increasing the top rate of income tax) or privatization of certain sectors of the economy. When stabilization occurs, its burden is often not shared equally by all segments of the society.

Consider an economy composed of two heterogenous groups. A fraction $\gamma > 0$ of government expenditure (including interest) is covered by taxes

$$\tau(t) = \gamma[rb(t) + g_0]$$

and $(1-\gamma)$ by issuing debt, $b(t)$:

$$\dot{b}(t) = (1-\gamma)[rb(t) + g_0]$$

where g_0 is government expenditure (constant). As taxes cover only a fraction of the deficit, public debt increases over time and so does the tax burden. Eventually the country will become unable to service its debt and will default. Moreover, taxes are assumed to be distortionary before stabilization and therefore inefficient.

This implies that both the stock of debt and taxes grow exponentially:

$$b(t) = b_0 e^{(1-\gamma)rt} \frac{g_0}{r}(e^{(1-\gamma)rt} - 1)$$

and

$$\tau(t) = \gamma r \overline{b} e^{(1-\gamma)rt}$$

where $\overline{b} \equiv b_0 + \frac{g_0}{r}$ is the present value of debt at $t = 0$.

When stabilization is implemented at $t = T$, taxes increase so that no new debt needs to be issued:

$$\tau(T) = rb(T) + g_0 = r\overline{b}e^{(1-\gamma)rT}$$

Stabilization requires an agreement between the two socio-economic groups about sharing the burden of additional taxation. The group that initiates stabilization bears $\alpha > \frac{1}{2}$ of the burden whereas the other group bears $(1-\alpha)$.

Assume that taxes before stabilization are distortionary. The groups differ in the impact of distortion, θ_i. θ_i is only known to the group itself but the distribution from which it is drawn is public knowledge. After stabilization, $\theta_i = 0$: taxes are no longer distortionary. The utility of group before stabilization i is

$$u_i(t) = c_i(t) - \theta_i \tau(t)$$

while the corresponding utility after stabilization is

$$u_i(t) = c_i(t)$$

Consumption before stabilization is (assuming each group bears $\frac{1}{2}$ of the tax burden before stabilization)

$$c^D(t) = y - \frac{\gamma}{2} r \overline{b} e^{(1-\gamma)rt}$$

After stabilization, the consumption of winners and losers, respectively, is

$$c^W(t) = y - (1-\alpha) r \overline{b} e^{(1-\gamma)rt}$$

$$c^L(t) = y - \alpha r \overline{b} e^{(1-\gamma)rt}$$

The difference in discounted life-long consumption between the winners and the losers is then

$$\frac{(c^W - c^L)}{r} = (2\alpha - 1) \overline{b} e^{(1-\gamma)rT}$$

The optimal concession time for a group with θ_i can be derived: $T_i(\theta_i)$ such that $T_i^{\prime}(\theta_i) < 0$. Hence, the higher is the group-specific distortion caused by taxes before stabilization, the sooner the group will concede. Concession occurs when the group's cost of waiting equals the marginal benefit from waiting. The cost of waiting is constant over time, $\gamma(\theta + ½ - \alpha)$. The benefit from waiting is dynamic: at each point in time, each group updates its expected probability that the other group will concede first.

Hence, waiting and war of attrition occur because θ_i are private information: if both groups knew their opponents θ, the one with the higher value would concede immediately.

Political cohesion: If $\alpha = \frac{1}{2}$, stabilization occurs immediately as there is no gain from delaying stabilization. The larger is α, the later is the expected date of stabilization.Hence, distributional implications of reform/stabilization cause its delay.

Similar to the Fernandez-Rodrik model, but here the identity of winners and loses is endogenous: it depends on the group-specific cost of postponing stabilization, θ.

Big Bang vs Gradualism in Fernandez-Rodrik Model

Often, reform consists of multiple steps that can be introduced either simmultaneously (*Big Bang*) or sequentially (*Gradual Reform*). Big-bang reform is faster but may be more costly in the short term. Gradual reform brings about lower immediate costs but the eventual improvement after its implementation is delayed.

Consider two reform measures, indexed with $i = 1, 2$. Individual payoff from reform i: a gain $g_i > 0$ with probability p_i and a loss $l_i < 0$ with probability $1 - p_i$. Reversal costs: c for the full reform and c_i for reform i, $c, c_i < 0$. Assume $(g_1 + l_2) > (l_1 + g_2)$ and the median voter receives $(l_1 + g_2)$.

Implementation Constraint (IC): Big Bang will be implemented if

$$p_1 g_1 + (1 - p_1) l_1 + p_2 g_2 + (1 - p_2) l_2 > 0$$

Assume complementarities—if only one reform is implemented, the outcome is reduced by γ so that a partial reform is never optimal: $p_1 g_1 + (1 - p_1) l_1 - \gamma < c_1 < 0$.
The expected payoff of a gradual reform (δ is the discount rate):

$$(1 - \delta)[p_1 g_1 + (1 - p_1) l_1 - \gamma] + \delta[p_1 g_1 + (1 - p_1) l_1 + p_2 g_2 + (1 - p_2) l_2]$$

Note that because of complementarities, the interim payoff is negative and the payoff of the full reform is postponed (interim suffering).

At $t = 1$, voters must decide whether to reverse reform 1 or implement reform 2. The winners of reform 1 prefer full reform. Because $p_1 < \frac{1}{2}$, the losers of reform 1 are pivotal, so that reform 1 will be reversed if reversing reform 1 is more attractive (less painful) than the gain from implementing reform 2:

$$l_1 + p_2 g_2 + (1 - p_2) l_2 < c_1$$

It is possible that the full reform is socially optimal:

$$p_1 g_1 + (1 - p_1) l_1 + p_2 g_2 + (1 - p_2) l_2 > 0$$

but reform 1 is reversed under gradualism:

$$l_1 + p_2 g_2 + (1 - p_2) l_2 - c_1 < 0$$

Rearranging terms, full-reform IC is

$$p_1 (g_1 - l_1) + l_1 + p_2 g_2 + (1 - p_2) l_2 > 0$$

Then, gradual reform will be reversed if:

$$p_1 (g_1 - l_1) > -c_1$$

Gradualism reinforces the status quo bias: it either leads to the same outcome as big bang but with interim suffering, or it results in interim reversal where a big bang would be successful. Hence, with only individual uncertainty, big bang always dominates gradualism.

Big Bang vs Gradualism with Aggregate Uncertainty

Two reforms with uncertain outcomes (depending on the states of nature $j = 1, \ldots, J$ and $k = 1, \ldots, K$): O_{1j} and O_{2k}. The net-present-value payoff of the full reform is $F(O_{1j}, O_{2k})$, regardless of sequencing. The payoff of a partial reform is $P(O_{im})$. Assume complementarity: $F(O_{1j}, O_{2k}) \gg P(O_{im})$. The status-quo payoff is 0.

Reforms can be reversed at costs c for the full reform and c_i for reform i:

$$0 > \min(c_1, c_2) > c > c_1 + c_2$$

A partial reform is never optimal: $P(O_{im}) < c_i$.

Observing $P(O_{im})$ reveals information about the realization of O_{im}. Hence, knowing $P(O_{im})$, voters can update their expectations about the likely outcome of the full reform. $P(O_{im})$ thus yields a signal S_{in} about $F(O_{1j}, O_{2k})$, leading to updated expectations $E_{jk}[F(O_{1j}, O_{2k})|S_{in}]$. The signals can be ranked so that

$$n > n' \Rightarrow E_{jk}[F(O_{1j}, O_{2k})|S_{in}] \geq E_{jk}[F(O_{1j}, O_{2k})|S_{in'}]$$

The expected payoff of big bang is

$$BB = (1-\delta)E_{jk}F(O_{1j}, O_{2k}) + \delta E_{jk} \max[c, F(O_{1j}, O_{2k})]$$

Under gradualism (by backwards induction), the continuation payoff of implementing reform 2 (knowing S_{in}) is

$$R_2(S_{in}) = (1-\delta)E_{jk}[F(O_{1j}, O_{2k})|S_{in}] + \delta E_{jk} \max[c, F(O_{1j}, O_{2k})|S_{in}]$$

Define $\tilde{n}$ such that for all $n \geq \tilde{n}$, reform 2 yields a higher payoff than the reversal of reform 1: $R_2(S_{in}) \geq c_1$.

The expected payoff of a gradual reform then is

$$GR_{12} = (1-\delta)E_j P(O_{1j}) + \delta \Pr(n < \tilde{n})c_1 + \delta \Pr(n \geq \tilde{n})E_{n \geq \tilde{n}} R_2(S_{in})$$

Note: $BB = \Pr(n < \tilde{n})E_{n<\tilde{n}} R_2(S_{in}) + \Pr(n \geq \tilde{n})E_{n \geq \tilde{n}} R_2(S_{in})$. GR_{12} can be rewritten as

$$\begin{aligned} GR_{12} &= (1-\delta)E_j P(O_{1j}) + \delta \Pr(n < \tilde{n})c_1 + \delta \Pr(n \geq \tilde{n})E_{n \geq \tilde{n}} R_2(S_{in}) \\ &\quad + \delta \Pr(n < \tilde{n})E_{n<\tilde{n}} R_2(S_{in}) - \delta \Pr(n < \tilde{n})E_{n<\tilde{n}} R_2(S_{in}) \end{aligned}$$

Collecting terms yields:

$$GR_{12} = (1-\delta)E_j P(O_{1j}) + \delta BB + \delta \Pr(n < \tilde{n})[c_1 - E_{n<\tilde{n}} R_2(S_{in})]$$

The first term is the interim suffering: $(1-\delta)E_j P(O_{1j}) < 0$

The second term is the delayed payoff of a big bang.

The last term is the *Option Value of Early Reversal*. By definition of $\tilde{n}$: $R_2(S_{in}) < c_1$ for $n < \tilde{n}$. Therefore, the *OVER* is strictly positive whenever $\Pr(n < \tilde{n}) > 0$.

Hence, big bang is optimal when the interim suffering is very costly (complementarities are important), there is little or no learning from partial reform, or $\Pr(n < \tilde{n}) = 0$ or is very low. In contrast, it is possible also that $GR > 0 > BB$ so that gradualism helps overcome the status quo bias. With uncertainty, gradualism allows learning and delays a potentially costly decision (note that big bang would be optimal if $c = c_1$) to get more information about the future outcomes. The greater is uncertainty, i.e. the greater is $\Pr(n < \tilde{n})$, the more attractive gradual reform becomes.

When there is no discounting, $\delta \to 1$, then gradualism is always at least as good as big bang: $GR = BB + OVER$.

Other applications of option theory to economics (see Dixit and Pindyck, 1994): entry into or exit from currency unions, migration (Burda, 1995).

The Role of Complementarities

What role does complementarity play, i.e. when outcome of one reform measure depends on whether other reform measures have been implemented? Assume $F(O_{1j}, O_{2k}) = O_{1j} + O_{2k}$ and $P(O_{im}) = O_{im} - \gamma$.

A partial reform is never optimal: $O_{im} - \gamma < c_i < 0$.

Gradualism can still be optimal, even with complementarities. After reform 1, reform 2 will be implemented as long as $R_2(O_{1j}) > c_1$:

$$(1-\delta)[O_{1j} + E_k(O_{2k})] + \delta \max[c, O_{1j} + E_k(O_{2k})] > c_1$$

or, substracting c_1 from both sides

$$(1-\delta)[O_{1j} - c_1 + E_k(O_{2k})] + \delta \max[c - c_1, O_{1j} - c_1 + E_k(O_{2k})] > 0$$

Then, the second reform will be implemented even if its expected payoff is negative, $E_k(O_{2k}) < 0$, as long as if $O_{1j} - c_1 + E_k(O_{2k}) > 0$. The second reform needs to be implemented so as to keep the benefit of the first reform. By implementing it, the cost of reversing reform 1 is avoided (note that a partial reform in not optimal). Hence, complementarities lead to momentum effects: the positive outcome of the first reform facilitates implementation of the second reform.

Note that the implementation condition for big bang is $E_j O_{1j} + E_k O_{2k} > 0$. With complementarities, gradualism thus relaxes the impementation constraint. Without complementarities ($\gamma = 0$), gradual reform is never optimal—either a big bang is implemented right away (if both reforms have positive payoffs), or only one reform takes place, or the status quo remains in place.

The Role of Reversal Costs

With $c = c_i = 0$, big bang always dominates gradualism, as it allows a complete revelation of the state of nature at no cost.

The Role of Sequencing

Proper sequencing of reforms can help build constituencies in support of the reforms.

Suppose only reform 1 is informative, i.e. implementing it yields a signal about the outcome of reform 2 but not vice versa. Assume the two reforms are otherwise identical. Then, a gradual reform that starts with reform 2 has zero $OVER$. Hence, $GR_{12} > GR_{21}$ so that sequencing matters.If reform 1 has a more favorable outcome, $O_{1j} > O_{2k}$ for every j and k, then it is better to start with that reform so as to build up momentum.If reform 1 is more risky, i.e. $E_j(O_{1j}) = E_k(O_{2k})$ but $Var(O_{1j}) > Var(O_{k2})$, then again $GR_{12} > GR_{21}$.

Volatility increases the option value of reversal, therefore, it is better to start with the more risky reform. Finally, suppose reform 1 benefits a greater proportion of the overall population than reform 2. Then, a gradual reform starting with reform 1 has a lower probability of an interim reversal, even it the final outcome is the same regardless of sequencing.

Divide-and-Rule Tactics

Consider the following simple case. Individuals belong to three different types: consumers (type 0) and two industrial sectors(1 and 2). A reform of either sector has positive repercussions for the consumers and the other sector. The payoffs and their distribution across individuals are known ex ante.

	Type 0	Type 1	Type 2
Reform 1	$g_1 > 0$	$l_1 < 0$	$g_1 > 0$
Reform 2	$g_2 > 0$	$g_2 > 0$	$l_2 < 0$
Overall Gain	$g_1 + g_2 > 0$	$l_1 + g_2 < 0$	$g_1 + l_2 < 0$

Assume reforms are irreversible and must be approved by a majority. All three types are equally represented in the population, hence, a reform will be approved if it has support of at least two types.

A big bang (Reforms 1 and 2 simultaneously) will be rejected when submmitted to a popular vote. In case of a gradual reform, types 1 and 2 are better off if they collude to reject both reforms. However, such collusion agreement will not be credible.

Suppose R1 is voted upon at $t = 1$ and R2 is voted upon at $t = 2$. By backward induction, R2 will be supported at $t = 2$ by votes of types 0 and 1. Knowing this, type 2 will vote for R1 at $t = 1$ and both reforms will be approved.

Alternative voting procedure: Both reforms will also be approved if two independent votes take place at $t = 1$ (i.e. two separate ballots). Hence, if the government takes advantage of its agenda-setting power, it can carry out reforms that would not be acceptable otherwise.

Dynamics of Political Support for Reform

Reforms typically enjoyed very high support at the outset of transition but over time, this support dissipated. Rodrik (1995) and Fidrmuc (1996, 1999) model this dynamics of preferences as being driven by the gradual resolution of uncertainty about identity of winners and losers. The model is similar to that of Fernandez and Rodrik (1991) but is constructed in a dynamic framework.

Consider the evolution of employment in the state sector, N_t, in the private sector, M_t, and unemployment, U_t. Before transition, $U_0 = 0$ and most workers are in the state sector. The reform induces a gradual contraction of the state sector and an expansion of the private sector, until they reach N^* and M^*, respectively; N^* and M^* are exogenous *target* values.The adjustment follows the following patterns:

$$N_t = N_{t-1} + \theta(N^* - N_{t-1})$$

$$M_t = M_{t-1} + \theta k(M^* - M_{t-1})$$

where θ is the speed of reform and $k \in (0,1)$ is a parameter capturing labor-market frictions.

The government sets the speed of reform by setting the level of subsidy to the state sector, σ_t: $\theta = \theta(\sigma_t)$, $\theta'(\sigma_t) < 0$. The subsidy is financed by a tax on the private sector, τ_t. The tax also finances unemployment benefits, assumed to be a fixed fraction of the subsidy: $b_t = \mu\sigma_t$. The budget is balanced every period:

$$M_t\tau_t = (N_t + \mu U_t)\sigma_t.$$

A worker in the state sector (SS) or an unemployed worker (UE) finds a job in the private sector (PS) with prob

$$z_t = \frac{M_t - M_{t-1}}{N_{t-1} + U_{t-1}}$$

A worker in SS loses his job with prob

$$q_t = \frac{N_t - N_{t-1}}{N_{t-1}}$$

Initially, more SS workers are fired every period than can find jobs in the PS, $q_t > z_t$, but eventually, jobs become available also in the SS (because PS can hire workers also directly from SS). An unemployed worker will be rehired in the state sector with prob

$$f_t = \max\left[\frac{(z_t - q_t)N_{t-1}}{(1 - z_t)U_{t-1}}, 0\right]$$

There is no termination of jobs in PS.

Hence, a worker who is in SS at time t will at a later time s either have a PS job, will have a SS job, or will be unemployed. The prob of having a PS job is

$$r_t(s) = 1 - \Pi_{i=t}^{s}(1 - z_t)$$

The prob of being unemployed is

$$c_t(s) = \max[q_t - z_t, 0]\Pi_{j=t}^{s}[1 - (z_j + (1 - z_j)f_j]$$
$$+ \left\{ \begin{array}{c} \Sigma_{i=t+1}^{s} \max(q_i - z_i, 0)\Pi_{k=t}^{i-1}[1 - \max(q_k - z_k, 0)] \\ \Pi_{j=i}^{s}[1 - (z_j + (1 - z_j)f_j)] \end{array} \right\}$$

i.e. it is the prob that the worker becomes unemployed and then remains unemployed until s. The prob of still being in SS is $p_t(s) = 1 - r_t(s) - c_t(s)$.

A worker who is unemployed at t will have a PS job at s with prob $r_t(s)$ and a SS job with prob

$$d_t(s) = f_t\Pi_{j=t}^{s}(1 - z_j) + \Sigma_{i=t+1}^{s} f_i\Pi_{k=t}^{i-1}(1 - f_k)\Pi_{j=1}^{s}(1 - z_j)$$

i.e. it is the prob of getting a SS job some time between t and s and remaining there. The prob of remaining unemployed is $e_t(s)1 - r_t(s) - d_t(s)$.

These probabilities change over time!

For a SS worker, the prob of having a PS job or of being unemployed are high early in transition but eventually converge to 0. In contrast, the prob of remaining in SS converges to 1.

For an unemployed worker, the prob of having a PS job declines over time and converges to 0. The prob of being in SS initially increases but then starts to fall and also converges to 0. If $N^* + M^* < 1$, the prob or being unemployed initially falls but later starts to increase and converges to 1.

Workers's earnings equal to their marginal products, 1 in the state sector and $\lambda > 1$ in the private sector, and the subsidy, unemployment benefits or tax (as applicable): SS workers earn $w_t^s = 1 + \sigma_t$, PS workers earn $w_t^p = \lambda - \tau_t$, and unemployed workers receive $\mu\sigma_t$.

The changing probabilities affect workers' expected utilities and, in turn, their preferences about the speed of reforms. Early on, SS workers face a high prob of getting a PS job and therefore support a big-bang ($\sigma_t = 0$), as this increases their expected future earnings. Later, however, as the prob of getting a PS job becomes smaller, they start supporting a high subsidy instead.

The dynamics of preferences of unemployed workers are similar as long as $\mu > 0$ and $N^* + M^* < 1$. Otherwise, they always support a big bang.

The model thus predicts that support for reforms will be high (universal) at the begining but will fall later as SS workers and unemployed workers change their preferences. This change of preferences reflects the gradual resolution of uncertainty about the distribution of winners and losers.

Credibility and Popular Support for Reform

Cukierman and Tommasi (AER 1998; 180-197).

Radical policy reforms are often implemented by politicians/parties having an a-priori bias against such policies (e.g. Nixon bringing about reconcilation with China). Transition economies: privatization in Poland and Hungary and pension reform in Hungary were implemented by the former communists; in contrast, a right-wing government in the Czech Republic was unable to implement serious enterprise restructuring and hard-budget constraint.

Outcome of the reform is a-priori uncertain and depends on *state of nature*: e.g. pension reform can be driven by the need to avoid unsustainable pension burden for future generations but it can also be proposed for entirely ideological motives. *Unlikely politicians* can better credibly signal the need for reform as they are not expected to have an ideological bias in favor of the reform's objectives.

Utillity of voter j:

$$-|x^e - (c_j + \gamma^e)|$$

where x is a policy, c_j is a constant, $\gamma \sim N(0, \sigma_\gamma^2)$ reflects the state of nature and e denotes expectations.

There are two parties: R and L. When party party i is in office, it will promise (and implement) x_i and its utility is:

$$h - |x_i - (c_i + \varepsilon_i + \gamma)|$$

where $c_L < c_R$ (constant and common knowledge), h is the utility from being in office, $\varepsilon_i \sim N(0, \sigma_\varepsilon^2)$ is a shock to the party's ideological position (known only to the party but not common knowledge). Note that the parties can observe γ.

Timing: (1) The incumbent observes γ and his ε and proposes x. The voters either accept or reject x. (2) x is implemented if accepted, otherwise the challenger implements his preferred policy (knowing γ and his ε).

Equilibrium: Suppose L is the incumbent. It chooses a policy to maximize

$$P^L(x_L)[h - |x_L - (c_L + \varepsilon_L + \gamma)|] + [1 - P_L(x_L)][E(x_R|\gamma) - (c_L + \gamma)]$$

where P^L is the prob of reelection.

If R is elected instead, he will implement $x_R = c_R + \varepsilon_R + \gamma$. Voters cannot observe γ but form expectations based on x_L, so that $x_R^e \equiv E(x_R|x_L) = c_R + \gamma^e$.

Hence, the incumbent's utility function is

$$P^L(x_L)[h - |x_L - (c_L + \varepsilon_L + \gamma)|] + [1 - P_L(x_L)](c_R - c_L)$$

Assume (method of undetermined coeficients) $x_L = B_L + b_L(\gamma + \varepsilon_L)$. Hence, the voters' expectation of γ is

$$\gamma^e = \frac{\sigma_\gamma^2}{\sigma_\gamma^2 + \sigma_\varepsilon^2} \frac{(x_L - B_L)}{b_L} = \theta \frac{(x_L - B_L)}{b_L}.$$

Hence, x_L constitutes a signal about γ but this signal is noisy and affected by θ.

Define c_m^c as the bliss point of the voter who is indiferent between voting for left and right. Then, c_m^c is obtained from

$$|x_L - \gamma^e - c_m^c| = |x_R^e - \gamma^e - c_m^c|.$$

Assuming $x_L^e < x_R^e$,

$$\gamma^e + c_m^c - x_L = x_R^e - \gamma^e - c_m^c.$$

Since $x_R^e \equiv c_R + \gamma^e$,

$$c_m^c = \frac{1}{2}(c_R + x_L - \gamma^e).$$

c_m is uniformly distributed, hence

$$P^L(x_L) = \frac{c_m^c - \underline{c}}{\overline{c} - \underline{c}}.$$

Note that

$$c_m^c = \frac{1}{2}\left(c_R + x_L - \theta\frac{(x_L - B_L)}{b_L}\right) = \frac{1}{2}\left[c_R + \left(1 - \frac{\theta}{b_L}\right)x_L + \theta\frac{B_L}{b_L}\right].$$

substitute for c_m^c in the expression for $P^L(x_L)$:

$$P^L(x_L) = \frac{1}{2}\frac{1}{\overline{c} - \underline{c}}\left[c_R - 2\underline{c} + dx_L + \theta\frac{B_L}{b_L}\right].$$

where $d \equiv \left(1 - \frac{\theta}{b_L}\right)$. Substitute for $P^L(x_L)$ in party L's objective function to obtain FOC and SOC. There are two cases:

For $x_L > c_L + \varepsilon_L + \gamma$:

$$d(h - x_L + \varepsilon_L + \gamma + c_R) - 2(\overline{c} - \underline{c})P^L(x_L) = 0$$

$$-d < 0$$

or after rearranging

$$x_L = \frac{1}{2d}\left[d(c_R + h) - c_R - \theta\frac{B_L}{b_L} + 2\underline{c}\right] + \frac{1}{2}(\gamma + \varepsilon_L)$$

For $x_L < c_L + \varepsilon_L + \gamma$:

$$d[h + x_L - (2c_L + \varepsilon_L + \gamma) + c_R] + 2(\overline{c} - \underline{c})P^L(x_L) = 0$$

$$d < 0$$

or after rearranging

$$x_L = \frac{1}{2d}\left[2\underline{c} - c_R - \theta\frac{B_L}{b_L} + d(2c_L - c_R - h)\right] + \frac{1}{2}(\gamma + \varepsilon_L).$$

Recall we imposed $x_L = B_L + b_L(\gamma + \varepsilon_L)$. Hence, $b_L = \frac{1}{2}$ and the expression for B_L can be derived analogously for the two cases.

As $b_L = \frac{1}{2}$, this implies that

$$d = \frac{\sigma_\varepsilon^2 - \sigma_\gamma^2}{\sigma_\varepsilon^2 + \sigma_\gamma^2}$$

so that the SOCs imply that $\sigma_\gamma^2 < \sigma_\varepsilon^2$ for $x_L > c_L + \varepsilon_L + \gamma$ and $\sigma_\gamma^2 > \sigma_\varepsilon^2$ for $x_L < c_L + \varepsilon_L + \gamma$. Hence, depending on the relative volatility of γ and ε, proposing a higher (i.e. closer to the *center*) x_L either increases ($\sigma_\gamma^2 < \sigma_\varepsilon^2$) or decreases ($\sigma_\gamma^2 > \sigma_\varepsilon^2$) $P^L(x_L)$. Therefore, party L will either propose a more centrist or a more extremist policy than its ideal point.

There are two effects: *Hotelling* effect (moving closer to center increases the prob of reelection) and expectation effect (moving to the right also increases γ^e and thus lowers the prob of reelection). When $\sigma_\gamma^2 < \sigma_\varepsilon^2$, the Hotelling effect dominates. When $\sigma_\gamma^2 > \sigma_\varepsilon^2$, the expectation effect dominates.

The derivation for *R* being the incumbent is analogous.

The interesting case is $\sigma_\gamma^2 < \sigma_\varepsilon^2$ where *L* can increase its chance of reelection by proposing a right-wing policy (and vice versa for *R*). Cukierman and Tommasi show that:

- Moderate LW policies are more likely to be implemented by the *L* party whereas moderate RW policies are more likely to be implemented by the *R* party.
- More extreme policies are more likely to be implemented by the party of the opposite orientation.
- Very extreme policies will *only* be implemented by the opposite party.

Intuition: Suppose the state of nature calls for a RW policy (privatization). If *R* is the incumbent, then voters interpret a move further to the right mainly as a change in *R*'s ideological standpoint rather than a change in γ (ε is more volatile than γ). Hence, this policy change actually lowers *R*'s chance of reelection because *R* is moving further away from the median voter. When *L* proposes a RW policy, it moves closer to the median voter (the median also moves to the right in response to x_L but because the signal is noisy the median moves by less than *L*). For an extreme RW policy, *L* gets so close to the median (or even to the right of him) that it sweeps the election. Hence, a RW policy is more credible and hence has a greater chance of success when suggested by a LW incumbent, and vice versa.