5 Políticas cambiarias y monetarias

5.1 Preliminares: credibilidad

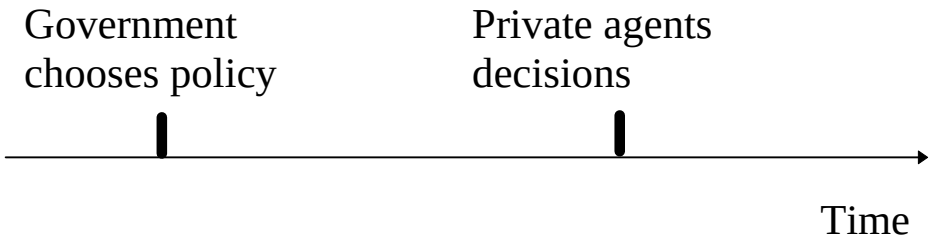
Credibility

Starting point: ruling out systematic cheating...
Example: abuse of surprise inflation.

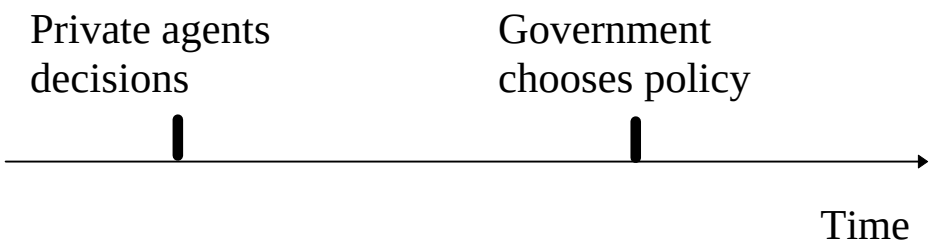
Cheating (like crime) requires two things: *opportunity* and *motive*

i) *Opportunity*: timing

Commitment



Discretion



ii) *Motive* (incentives to surprise):

Lack of enough instruments $\rightarrow$ second best $\rightarrow$ cheating in order to move towards the first best

No systematic cheating requires:

- no opportunity: *commitment technology*, or ...
- no incentives: *time consistent policies*

Definition: A policy is time *in*consistent if - given that it is expected by the private sector - the optimal plan made for period t + j at time t is different from the optimal plan made for that period at time t + j.

5.2 The basic model

The setting:

* Law of one price: Price (domestic currency) = E

* Players: government and central trade union

* Timing: discretion or commitment

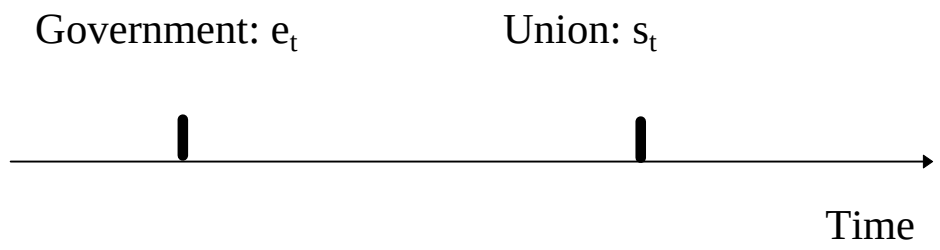
* Union solves: $S^{*} = \underset{S}{\text{Argmax}} \ \frac{S.L(S/E)}{E}$

  $\Rightarrow$ Union's real wage target: $s_U = \ln\left(\frac{S^{*}}{E}\right)$

* Government loss function:

$$G(s_t, e_t) = (s_t - e_t - s_G)^2 + a(e_t - e_{t-1})^2$$

Commitment:



Solving by backward induction:

1) Union chooses s_t knowing e_t, hence: $s_t = s_U + e_t$

2) Government solves:

$$\underset{e_t}{\text{Minimize}} \ (s_t - e_t - s_G)^2 + a(e_t - e_{t-1})^2$$

$$\text{s.t.} \qquad s_t = s_U + e_t$$

With solution: $\boxed{e_t = e_{t-1}}$

Results under commitment:

- Real wage (competitiveness) = s_U
- Inflation = e_t - e_{t-1} = 0

Discretion

Backward induction:

1) Government chooses e_t ... *given nominal wages*

$$\begin{array}{ll} \underset{e_t}{\text{Minimize}} & \left(s_t - e_t - s_G\right)^2 + a\left(e_t - e_{t-1}\right)^2 \\ \text{s.t.} & s_t = \text{constant} \end{array}$$

$\Rightarrow$ government reaction function (or best response):

$$\boxed{e_t = \frac{s_t + a\, e_{t-1} - s_G}{1+a}}$$

2) Union picks s_t *anticipating government's response:*

$$\boxed{s_t = s_U + E[e_t] = s_U + \frac{s_t + a\, e_{t-1} - s_G}{1+a}}$$

Notice, we have used two important hypotheses here:

- Union knows government incentives
- Union forms expectations rationally, using the information it has about government incentives

Economic performance under discretion?

1) Union still manages to get its real wage target: $s_t - e_t = s_U$

2) Variation of nominal wages:

$$\boxed{s_t - s_{t-1} = \frac{s_U - s_G}{a}}$$

Crucial assumption: there is a motive to cheat, for $s_U > s_G$

Hence, under discretion, there is an *inflationary bias*:

$$e_t - e_{t-1} = s_t - s_{t-1} > 0$$

Puzzle: government devalues to reduce real wages, but it fails, and causes inflation. Yet, it is perfectly rational!
Should government decide not to devalue? Not credible, it is time inconsistent.

Rules rather than discretion...

... the advantage of tying one's own hands...

Payoffs matrix:

	Commitment		Discretion
Union's utility	$U(s_U)$	=	$U(s_U)$
Government's losses	$(s_U - s_G)^2$	<	$\frac{1+a}{a}(s_U - s_G)^2$

$\Rightarrow$ commitment Pareto dominates discretion

Policy implication: make commitments, if possible...

Costs of inflation and rate of inflation (Fischer and Summers, 1989)

Notice: inflationary bias is *decreasing* in coefficient “a”.

$\Rightarrow$ Countries adapted to inflation (low a) have higher inflation.

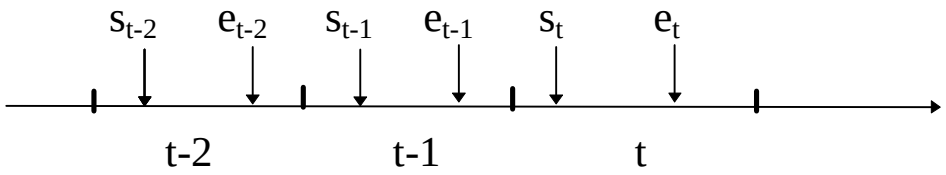
$\Rightarrow$ Inflationary bias causes larger losses in countries that are better adapted to inflation!

5.3 Reputation

Motivation: reputation as a substitute for commitment...

Environment:

- discretion + repeated game



- complete information
- infinite horizon
- Government *per-period* losses:

$$G(s_t, e_t) = (s_t - e_t - s_G) + \frac{a}{2}(e_t - e_{t-1})^2$$

It can be shown that, with this loss function, government discretionary policy will be: $e_t - e_{t-1} = 1/a$

- Government *total* losses: $Total\ \ losses = \sum_{i=0}^{\infty} \delta^i G_{t+i}$, $0 \le \delta \le 1$

Proposition (existence of a reputational equilibrium):
The infinitely repeated game has a zero-inflation subgame perfect equilibrium, provided δ is large enough.

Proof
"Candidate" for equilibrium strategies profile: Union's + government's strategies.

i) Union's strategy:

For t = 0:

$$s_0 = s_U + e_{-1}$$

For t > 0:

$$s_t = s_{t-1} \quad \text{,if} \quad i)\, s_{t-1} = s_U + e_{t-2} = s_{t-2} \text{ ,and } ii)\, e_{t-1} = e_{t-2}$$

$$s_t = s_{t-1} + 1/a \quad \text{,otherwise}$$

Government's strategy:

For t = 0:

$e_0 = e_{-1}$, if $s_0 = s_U + e_{-1}$

$e_0 = e_{-1} + 1/a$, otherwise

For t > 0:

$e_t = e_{t-1}$,if i) $s_t = s_U + e_{t-1} = s_{t-1}$,and ii) $e_{t-1} = e_{t-2}$

$e_t = e_{t-1} + 1/a$,otherwise

Government's per-period losses:

$$\tilde{G} < G^{*} < \hat{G}$$

$\hat{G}$: One-shot game

G^{*}: "Cooperation":
i) zero inflation, ii) $s_t - e_t = s_U$

$\tilde{G}$: Cheating: $\tilde{G} = \underset{e}{\text{Min}}\, G\left(e, s^{*}\right)$

i) Government total losses, if it does not devalue (and union does not deviate):

$$G^* + \delta G^* + \delta^2 G^* + ... = \frac{1}{1-\delta} G^*$$

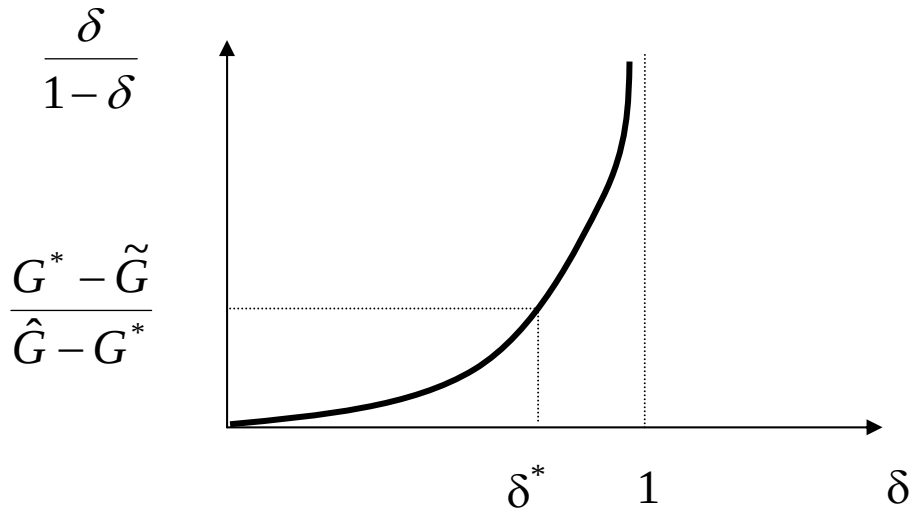
ii) Government total losses, if it devalues one period surprising private sector (it deviates, it “cheats”):

$$\tilde{G} + \delta \hat{G} + \delta^2 \hat{G} + ... = \tilde{G} + \frac{\delta}{1-\delta} \hat{G}$$

Hence, government does **not** deviate if and only if:

$$\underbrace{G^* - \tilde{G}}_{\text{temptation to cheat}} \leq \underbrace{\frac{\delta}{1-\delta}\left(\hat{G} - G^*\right)}_{\text{cost of cheating}} \qquad \textbf{(1)}$$

This inequality holds true for δ close enough to 1:



iii) Union does not deviate, for adopting the specified strategy it gets its first best: s_U

Inequality (1) and (iii) imply that the “candidate” is a Nash equilibrium.

What about subgame perfection?

iv) Show that deviating is not optimal *in any subgame*, including those out of equilibrium. No empty threats.

QED

Problems: multiple equilibria, coordinating expectations.

Complete information and finite horizon: no zero-inflation sub-game perfect equilibrium. Proof: backward induction.

5.4 Uncertainty and contingent rules

Productivity shocks taking place after wage setting $\Rightarrow$
Room for active output stabilization policies?

Assumptions

Productivity shock: ε_t , $E[\varepsilon_t]=0$, $E[\varepsilon_t^2]=\sigma^2$

Government real wage target: $s_G+\varepsilon_t$

Government expected losses:

$$G(s_t,e_t)=E\left[(s_t-e_t-s_G-\varepsilon_t)^2+a(e_t-e_{t-1})^2\right]$$

Functional form of the optimal policy rule:

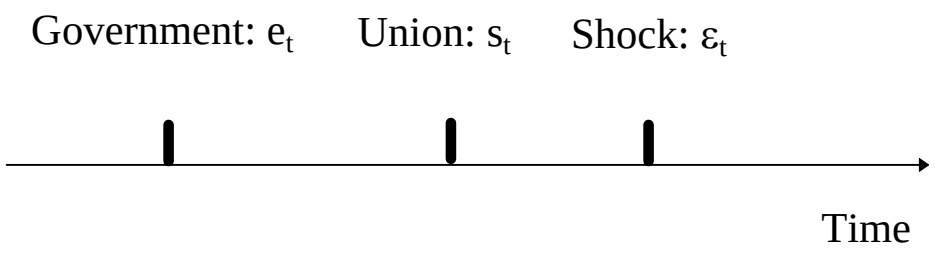
$$e_t - e_{t-1} = \bar{\kappa} + \kappa \varepsilon_t$$

Notice: this policy rule is contingent on the shock.

Union real wage target: s_U

“Simple” wage contracts: *no* contingent nominal wages.

Commitment



Solving by backward induction:

1) Union: $s_t = s_U + E[e_t] = s_U + e_{t-1} + \bar{\kappa}$

2) Government:

$$\underset{\bar{\kappa},\kappa}{\text{Minimize}}\ E\left[\left(s_t - e_t - s_G - \varepsilon_t\right)^2 + a\left(e_t - e_{t-1}\right)^2\right]$$

$$\text{s.t.} \qquad s_t = s_U + e_{t-1} + \bar{\kappa}$$

$$e_t = e_{t-1} + \bar{\kappa} + \kappa\varepsilon_t$$

$$\underset{\bar{\kappa},\kappa}{\text{Minimize}}\ E\left[\left(s_U - s_G - \kappa\varepsilon_t - \varepsilon_t\right)^2 + a\left(\bar{\kappa} + \kappa\varepsilon_t\right)^2\right]$$

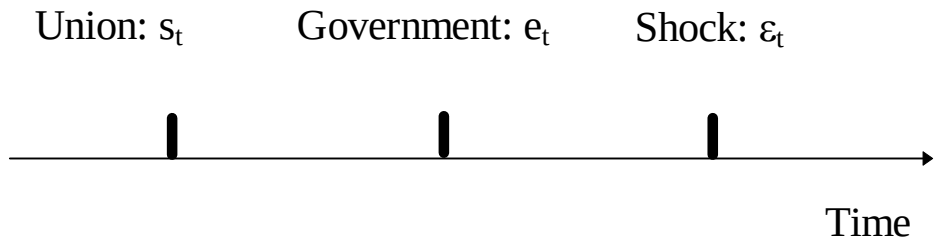
$$\Rightarrow\ \bar{\kappa} = 0 \quad ; \quad \kappa = -1/(1+a)$$

So, government policy under commitment will be:

$$e_t = e_{t-1} - \frac{1}{1+a}\varepsilon_t$$

Notice: *on average* inflation will still be zero, but government will cause inflation when negative realization of the productivity shock and deflation when positive shocks.

Discretion



Solving by backward induction:

1) Government:

$$\underset{\bar{\kappa},\kappa}{\text{Minimize}}\ E\left[\left(s_t - e_t - s_G - \varepsilon_t\right)^2 + a\left(e_t - e_{t-1}\right)^2\right]$$

$$\text{s.t.} \qquad s_t = \text{constant}$$

$$e_t = e_{t-1} + \bar{\kappa} + \kappa\varepsilon_t$$

2) Union: set s_t , knowing government incentives.

Solving:

$$\bar{\kappa} = \frac{s_U - s_G}{a} \quad ; \quad \kappa = -1/(1+a)$$

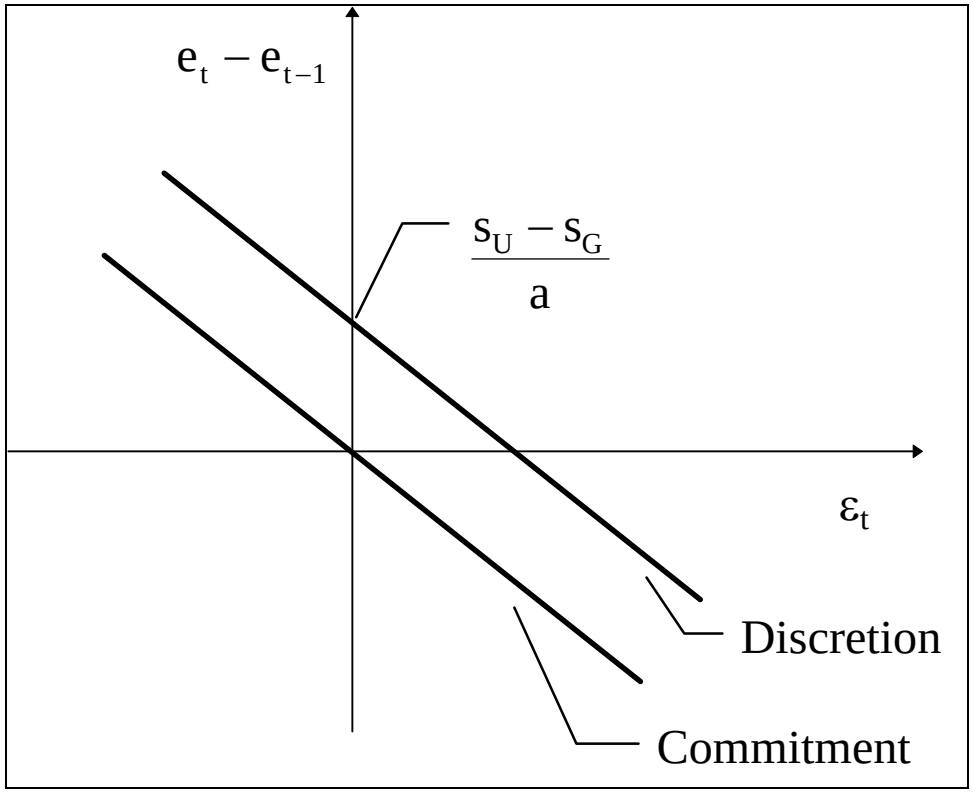
So, government policy under discretion will be:

$$e_t = e_{t-1} + \frac{s_U - s_G}{a} - \frac{1}{1+a}\varepsilon_t$$

Notice: *on average* inflation will be positive, hence there is an inflationary bias.

Union is not surprised: $s_t = s_U + e_{t-1} + \frac{s_U - s_G}{a}$

Comparing commitment and discretion



Government will be better off with commitment to this contingent rule: i) no inflationary bias, ii) same output stabilization than under discretion.

Normative implication: if possible, commit to a contingent rule.

Simple rules

Contingent rule is something very sophisticated. What if the government is not able to implement such policy rule, but can instead commit to a simpler rule, like a constant devaluation rate? Should it do it? If so, which rate?

Notice: we are moving now towards the normative issue...

The best simple (constant devaluation) rule: zero!

Welfare:

- Contingent rule dominates both simple rule and discretion. But it might not be available...

- Simple rule vs discretion: ambiguous! Simple rule avoids inflationary bias at a cost: not stabilizing output.

Normative implication: if contingent rule not available, choose simple rule of zero devaluation..., if credibility is a big issue while real shocks are relatively minor...

Several explanations for the use of simple rather than contingent rules:

1. Simple rules are cheaper.

2. Simple rules are more transparent, in the sense of facilitating monitoring and commitment ability (Cukierman, 1995, Herrendorf, 1998, Faust and Svensson, 1998).

3. Simple rules are more transparent, in the sense of increasing the signaling power of policies (Bordignon and Minelli, 1998).

4. Simple rules tie the hands of governments known to be "bad" (sensitive to pressure, etc.) (Harberger,1990; Slemrod, 1990).

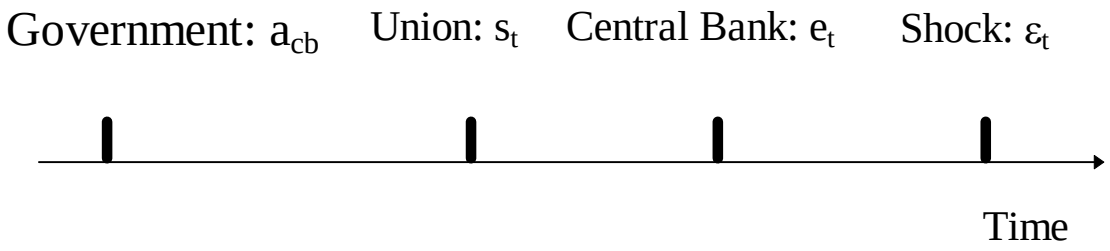
5.5 Institutions for credibility (normative analysis)

Independent Central Bank (Rogoff 1985)

Inflationary bias stemming from government inability to commit the exchange rate policy, i.e. from government playing after union. What if government can make a previous move, setting an independent Central Bank?

Delegation:

- Daily exchange rate policy delegated to the Central Bank. Central Bank has no commitment ability.
- Government appoints authorities of the Central Bank, according to rules that make them independent and stable.
- Government preferences over inflation (a_{gov}) not necessarily equal to Central Banker's preferences (a_{cb}).



Should government delegate exchange rate policy? If so, who should be the Central Banker?

Answer: yes, government should delegate exchange rate policy to someone more “conservative” (although not infinitely conservative) than government itself ($a_{cb} > a_{gov}$).

Proof (sketch, see problem set): (Backward induction)

1) Once in office, Central Bankers will implement the discretionary policy, with preferences a_{cb}:

$$e_t = e_{t-1} + \frac{s_U - s_G}{a_{cb}} - \frac{1}{1 + a_{cb}} \varepsilon_t$$

2) Government decides who the Central Banker will be:

$$a_{cb} = \underset{a}{\text{Argmin}}\ E\left[(s_t - e_t - s_G - \varepsilon_t)^2 + a_{gov}(e_t - e_{t-1})^2\right]$$

s.t. i) Central Bank's discretionary policy

$$e_t - e_{t-1} = \frac{s_U - s_G}{a} - \frac{1}{1+a}\varepsilon_t$$

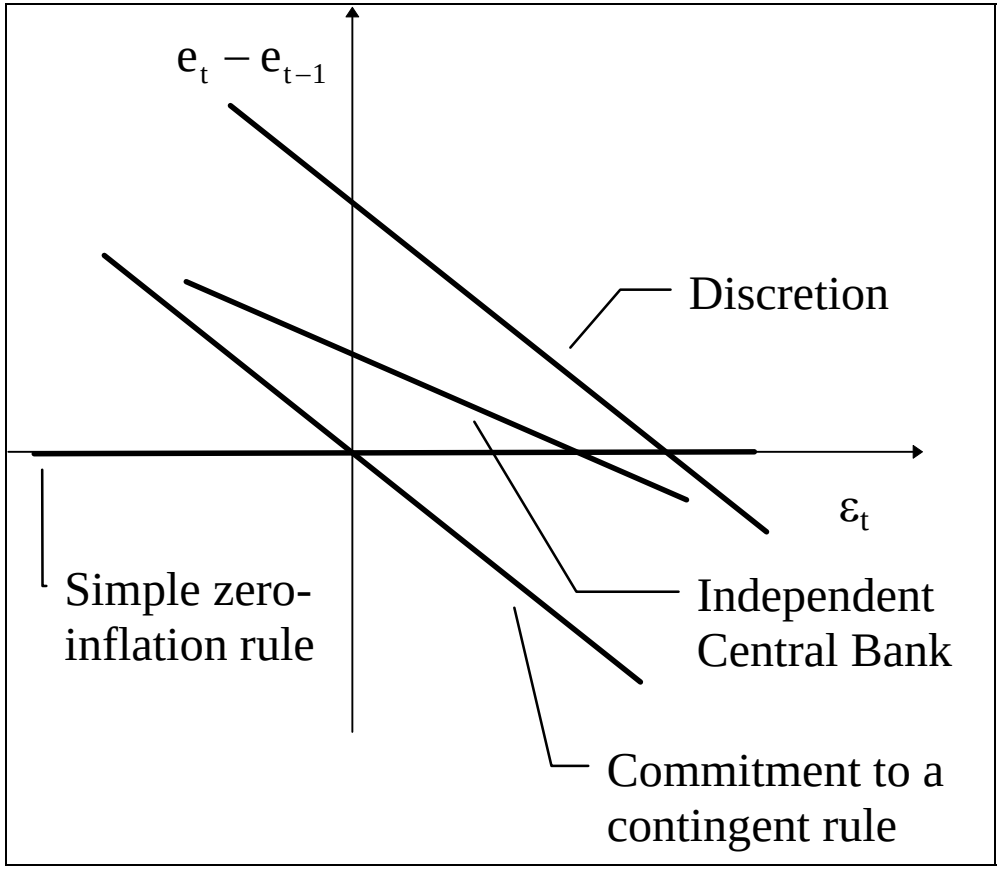
ii) Union's wage policy

$$s_t = s_U + E[e_t] = s_U + e_{t-1} + \frac{s_U - s_G}{a}$$

It can be shown that:

a) $a_{cb} > a_{gov}$, "conservative" Central Banker

b) $a_{cb} < \infty$, not "ultraconservative" Central Banker...

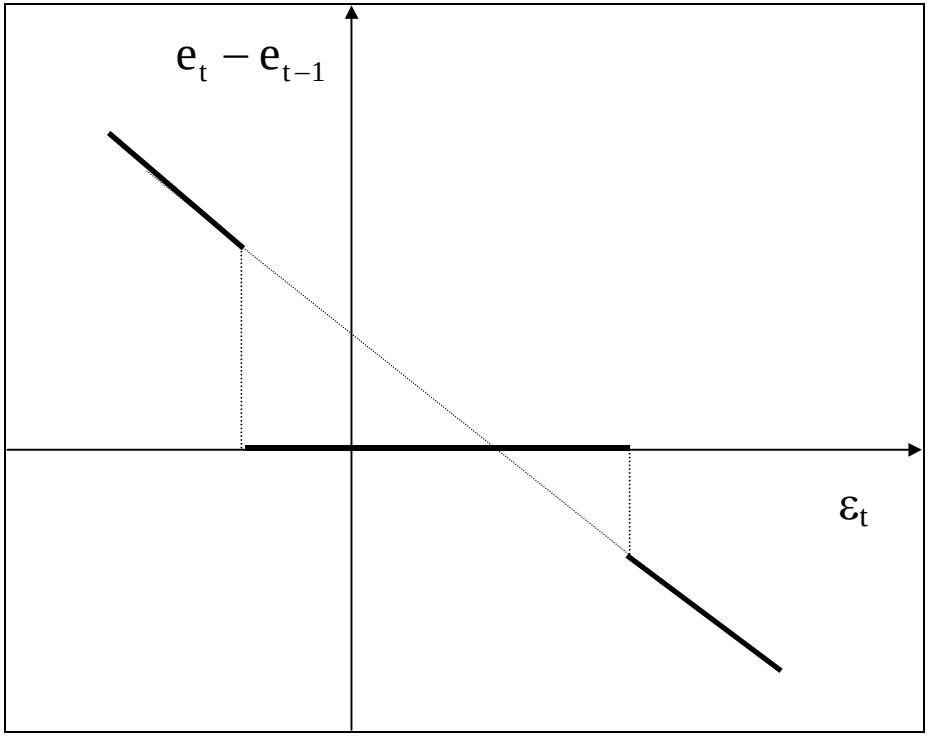

$e_t - e_{t-1}$
Discretion
ε_t
Simple zero-inflation rule
Independent Central Bank
Commitment to a contingent rule

Delegation vs discretion:

- lower inflationary bias
- less active in output stabilization
- higher welfare

Simple rule with escape clause (Flood and Isard, 1988)

Combine good properties of simple rules and discretion:
simple rule in normal times + discretion in exceptional times (when the shock is really large).


$e_t - e_{t-1}$
ε_t

Partially independent Central Bank (Lohman 1992)

Government delegates exchange rate policy to the Central Bank, but it can override the Central Bank in exceptional times.

Government losses:

$$E\left[\left(s_t - e_t - s_G - \varepsilon_t\right)^2 + a_{gov}\left(e_t - e_{t-1}\right)^2 + \delta c \right]$$

where: $\delta = 0$, if government does not intervene

$= 1$, if government overrides the Central Bank

and, $c > 0$

Institutional design means choosing a_{bc} and c.

Results:

- Independence region: Central Bank picks its discretional policy, if ε small.
- Accommodation region: Central Bank picks inflation between its own preferences and those of the government, if ε large. Otherwise, government would pay the cost c and override Central Bank, with the result of even larger inflation.

Some empirical evidence on Central Bank independence

Difficulty: measure of Central Bank independence.
Several dimensions:

- Who appoints the president of the Central Bank,
- How many years in office,

- Is it explicitly established that the Central Banker should pursue price stability?,
- How easy is for government to get credit from Central Bank?
- Bank supervision...

Results for OECD countries:
More independence associated to:
1. lower average inflation
2. lower variability of inflation
3. no real effects (neither level nor variance)
4. fiscal discipline: ambiguous.

5.6 Indexation

How does wage indexation affect inflationary bias?

Contemporaneous indexation

$$s_t = s_U + E[e_t] + \tau(e_t - E[e_t])$$

if $\tau = 0$, union demands nominal wage proportional to the expected exchange rate, getting real wage *on average* equal to s_U.

If $\tau = 1$, *perfect indexation*: $s_t = s_U + e_t \Rightarrow$ constant real wage

- no temptation to devalue, no inflationary bias
- no output stabilization

$\Rightarrow$ perfect indexation $\cong$ simple rule

Formal solution, backward induction:
1) Government solves

$$\underset{\bar{\kappa},\kappa}{\text{Minimize}}\ E\left[(s_t - e_t - s_G - \varepsilon_t)^2 + a(e_t - e_{t-1})^2\right]$$

s.t. i) Exchange rate policy

$$e_t - e_{t-1} = \bar{\kappa} + \kappa\varepsilon_t$$

ii) Union's wage policy

$$s_t = s_U + (1-\tau)E[e_t] + \tau e_t$$

Notice, when government's turn to play arrives:

- nominal wages are not a given, despite of discretion,
- $E[e_t]$ is a given

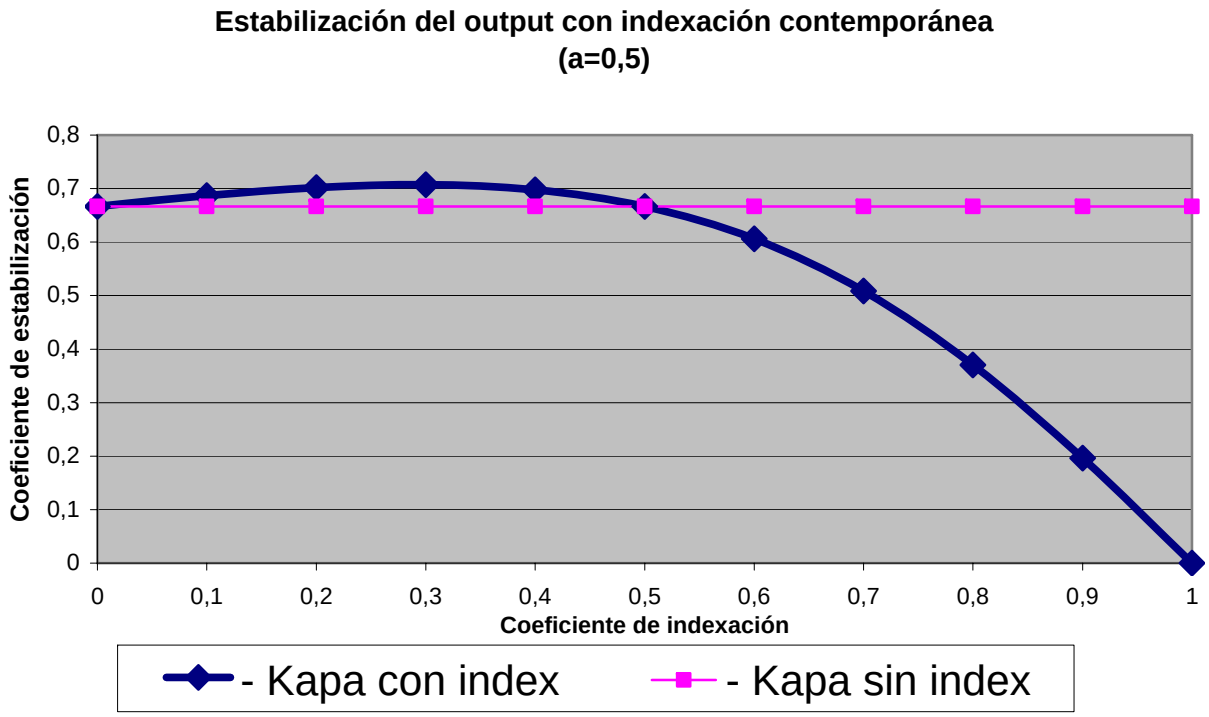
2) Union chooses wages knowing government incentives.

Solving, we get:

$$e_t - e_{t-1} = (1-\tau)\frac{s_U - s_G}{a} - \frac{1-\tau}{(1-\tau)^2 + a}\varepsilon_t$$

$\Rightarrow$

- Contemporaneous indexation reduces inflationary bias.
- Pero puede llegar a reducirse la estabilización del output, dependiendo de valores de parámetros:
  - (i) si $a>1$, gobierno estabiliza menos con indexación salarial
  - (ii) si $a \leq 1$, gobierno estabiliza más, si τ no demasiado grande


Estabilización del output con indexación contemporánea
(a=0,5)
Coeficiente de estabilización
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
0
0,1
0,2
0,3
0,4
0,5
0,6
0,7
0,8
0,9
1
Coeficiente de indexación
- Kapa con index
- Kapa sin index

Lagged indexation

$$s_t = \underbrace{s_U + e_{t-1}}_{\text{“Base” nominal wage}} + \underbrace{\tau\left(e_{t-1} - e_{t-2}\right)}_{\text{Indexation to past inflation}}$$

Base nominal wage = nominal wage that would yield real wage s_U, if exchange rate did not rise between t-1 and t.

Government solves:

$$\underset{\bar{\kappa},\kappa}{\text{Minimize}}\ E\left[\left(s_t - e_t - s_G - \varepsilon_t\right)^2 + a\left(e_t - e_{t-1}\right)^2\right]$$

s.t. i) Exchange rate policy

$$e_t - e_{t-1} = \bar{\kappa} + \kappa\varepsilon_t$$

ii) Union's wage policy

$$s_t = s_U + e_{t-1} + \tau\left(e_{t-1} - e_{t-2}\right)$$

Notice: nominal wages are again “a given”...

Exchange rate policy:

$$e_t - e_{t-1} = \frac{s_U - s_G + \tau\left(e_{t-1} - e_{t-2}\right)}{1+a} - \frac{1}{1+a}\varepsilon_t$$

$\Rightarrow$

i) Lagged indexation causes inflation inertia: more inflation today generates more inflation tomorrow.
ii) There is output stabilization, like in a discretionary regime without indexation.

Warning: these models of indexation are pretty ad-hoc. Indexation rules are not derived as optimal policies. Furthermore, the government is assumed to behave myopically or to solve a static problem, while the situation is indeed dynamic.

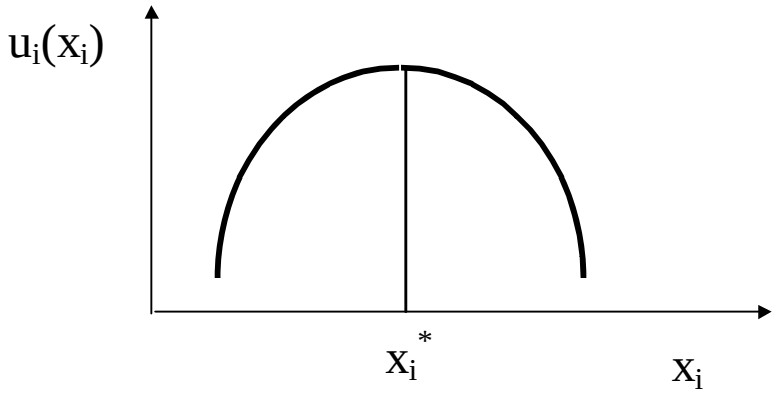
5.7 Political Cycles

Timing of elections, ideological orientation of governments, and political competition among different parties influence macroeconomic performance.

5.7.1 Preliminaries: elections and the median voter result

Assumptions:

- citizens vote over a unidimensional variable ‘x’, that represents either a policy (direct democracy) or a political party (representative democracy);
- citizens have different preferences over ‘x’;
- preferences are “single peaked”:



Political equilibrium (definition): policy that cannot be beaten under the majority rule.

Median voter result: if (i) single-peaked preferences, and (ii) majority rule, then the political equilibrium is the median voter bliss point (x^*_{median}).

Overview of the theoretical literature on political cycles

- "Opportunistic" (motivated by office) or "partisan" (motivated by ideology) politicians?

- Citizens are naive or rational?

5.7.2 Traditional opportunistic model (Nordhaus 1975)

Incumbent party creates an economic boom to raise probability of winning elections.

Assumptions:

1.Expectations-augmented Phillips curve.

2. Inflation expectations are adaptive.

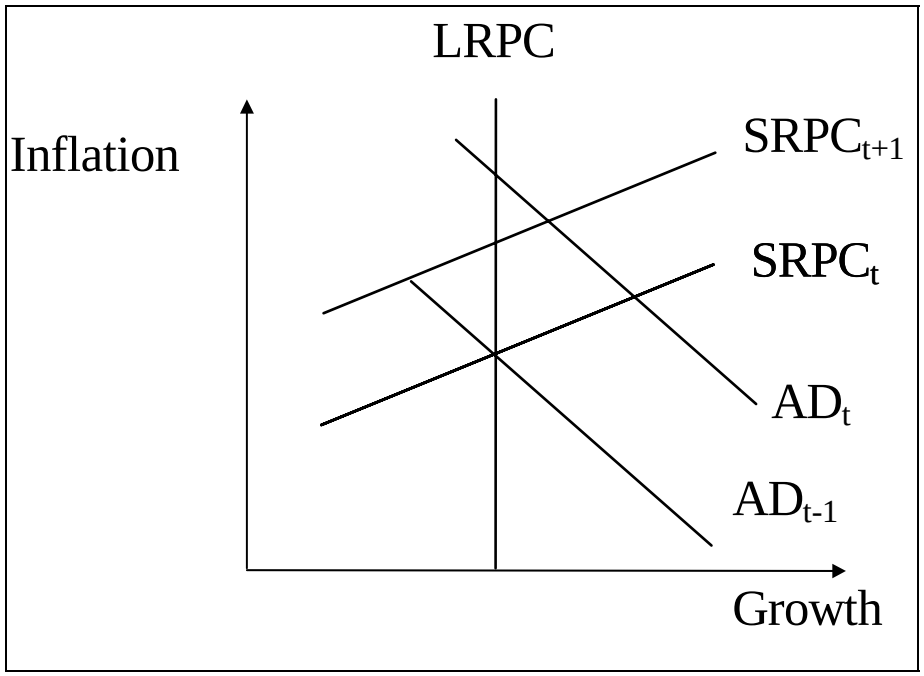
3. Politicians are identical. They prefer to be in office.

4. Two candidates in each election: incumbent and challenger.

5. Voters like output and dislike inflation. They are retrospective and heavily discount the past.

6. Policymaker controls an instrument related to aggregate demand.

7. Timing of elections is exogenous.



Elections take place at the end of t.

Government shifts aggregate demand (AD_t) to cause output growth along the short run Phillips curve ($SRPC_t$).
In t+1, agents revise expectations, hence the SRPC shifts upwards ($SRPC_{t+1}$), inflation increases further while output growth diminishes.

Empirical implications: growth above normal and moderate rise in inflation before elections, and recessions and higher inflation immediately after elections.

Main theoretical criticism: lack of rationality.

1. non-rational adaptive expectations, systematic errors;
2. non-rational voters, why should citizens vote an incumbent that created artificially high output before elections?

5.7.3 Rational opportunistic models

(Cukierman and Meltzer, 1986; Rogoff and Sibert, 1988; Persson and Tabellini, 1990)

Assumption of rational agents:

1. rational expectations about inflation
2. rational voters: maximize expected utility

Why might a rational citizen vote for an incumbent that creates a boom? Because booms could *signal competence.*

Assumptions:

1. Expectations-augmented Phillips curve with a competence term (ε_t):

$$y_t = \bar{y} + \pi_t - \pi_t^e + \varepsilon_t \quad , \quad \varepsilon_t \text{ is MA(1)}$$

2. Inflation expectations are rational. Voters do not observe incumbent's competence. They observe output, and *with delay* inflation.
3. Politicians prefer to be in office, but they also care about economic performance. They differ in competence.
4. Two candidates in each election: incumbent and challenger.
5. Voters want to elect the policymaker who maximizes their expected utility, that depends on inflation and output.
6. Policymaker controls inflation.
7. Timing of elections is exogenous.

Two types of equilibria:

1. *Pooling equilibrium*: both types choose the same output, no cycles.

2. *Separating equilibrium*: if the incumbent is competent, he might cause an output boom that an incompetent policymaker would not be able to create, thus signaling competence.

Implications (if separating equilibrium):
i) Expected inflation during election year in the middle between ex-post competent and incompetent inflation.
ii) Output boom and high inflation, if competent incumbent, and recession and low inflation, if incompetent incumbent.
iii) Retrospective voting: competent policymakers who create a preelectoral boom are reappointed. Hence: correlation between growth before elections and electoral results.

Criticism:

- Not appealing the assumption of inflation observed with a lag, but similar models have more convincing assumptions.

- It does not look likely that more competent politicians distort the economy, rather than the incompetent ones.
- No empirical evidence of opportunistic cycles.

Rational retrospective voting revisited

Alesina and Rosenthal 1995 propose a model of rational retrospective voting without electoral manipulation.

Assumptions:

- Higher output is (probabilistically) associated with higher competence: $y_t = \overline{y} + \pi_t - \pi_t^e + \varepsilon_t + \xi_t$
- Competence is persistent: ε_t is MA(1)
- Voters observe output and inflation *during the electoral year*.

$\Rightarrow$

1. It is rational to vote for the incumbent politician after having observed high output.
2. No room for manipulation and no cycles associated to competence signaling.

5.7.4. Traditional partisan model (Hibbs, 1977)

Left-wing parties create more inflation and achieve lower unemployment (exploitable Phillips curve with adaptive expectations) than right-wing parties.

Explanation: ideological motivation

Criticism: lack of rationality.

5.7.5 Rational partisan model (Alesina 1987)

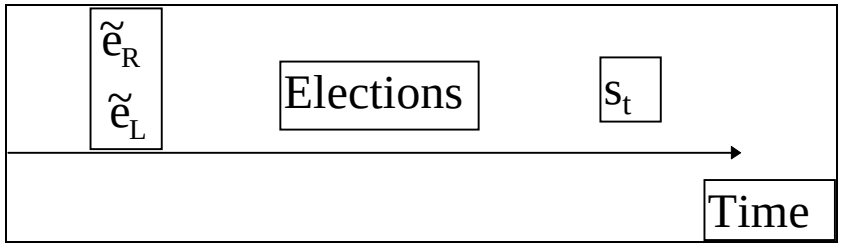
Assumptions:

1. Expectations-augmented Phillips curve, or nominal wage contracts:
   $s_t = s_U + E[e_t]$
2. Expectations are rational.
3. Voters with different preferences:
   $u_i = (s_t - e_t - s_G) + \frac{a}{2}(\tilde{e}_t - \beta_i)^2 \qquad , \ \beta_i \in (0, \bar{\beta})$
4. Politicians motivated by inflation and employment, just like citizens.
   Two parties: $\beta_{left} = \bar{\beta}, \ \beta_{right} = 0$
5. Two candidates in each election: incumbent and challenger.
6. Policymaker controls exchange rate.
7. Timing of elections is exogenous.

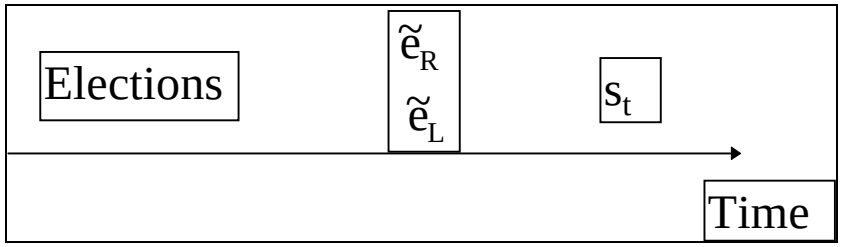
Two questions:
1. Who wins the election?
2. Which policy will the elected party implement?

Answers depend much on “timing”:

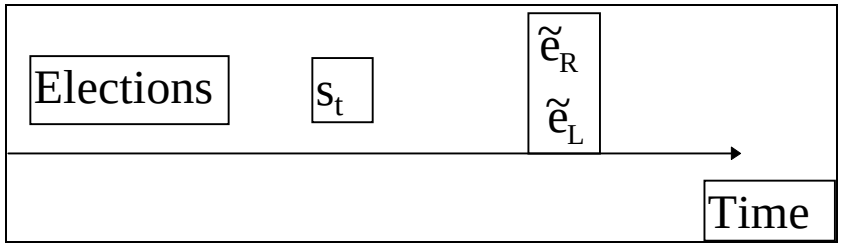
A) Economic and political commitment



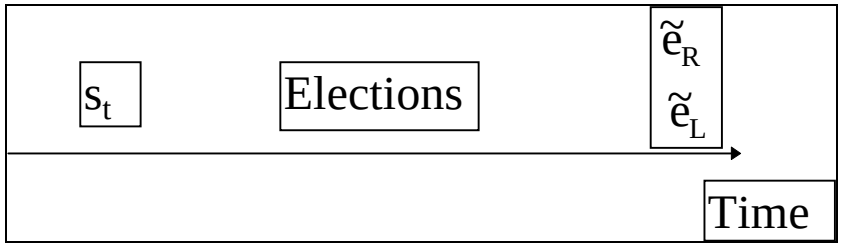
B) Economic but not political commitment



C) Full discretion and “flexible wages”



D) Full discretion with “inflexible wages”



Results:

A) Economic and political commitment
Convergence in policies to win elections: “even a partisan politician cannot implement his desired policies if he loses”.

Who wins the election if (binding) political platforms are $\tilde{e}_R$ and $\tilde{e}_L$?

The right party wins if : $\beta_{median} < \frac{\tilde{e}_R + \tilde{e}_L}{2}$ (2)

Full convergence: known $\beta_{median} \Rightarrow$ parties converge to the same policy.

Partial convergence: uncertain $\beta_{median} \Rightarrow$ parties tradeoff platforms for probabilities of winning.

$$\text{Prob}(\text{right party wins}) = \text{Prob}\left(\beta_{\text{med}} < \frac{\tilde{e}_R + \tilde{e}_L}{2}\right) = F\left(\frac{\tilde{e}_R + \tilde{e}_L}{2}\right)$$

Right party expected loss:

$$E\left[L_R(\tilde{e}_R, \tilde{e}_L)\right] = s_U - s_G + \frac{a}{2}\left\{F\left(\frac{\tilde{e}_R + \tilde{e}_L}{2}\right)\tilde{e}_R^{\,2} + \left[1 - F\left(\frac{\tilde{e}_R + \tilde{e}_L}{2}\right)\right]\tilde{e}_L^{\,2}\right\}$$

by raising $\tilde{e}_R$ right party get:

- higher probability of winning, but also
- not so low inflation...

$\Rightarrow$ $\tilde{e}_R = 0$ is suboptimal: raising it a bit involves a second order loss, in case of being elected, and a first order increase in the probability of being elected (see problem set).

B) Economic but not political commitment

Main results: no convergence + policy volatility

In repeated interaction, parties might agree on intermediate platform to reduce volatility, based on reputation.

C) Full discretion and “flexible wages”

Main results: no convergence + inflationary bias

Left party generates larger inflationary bias. Rational voters know it, hence political advantage for right party.

D) Full discretion with “inflexible wages”

Main result: partisan political cycle

- Economic policies:

  If right party wins: $\tilde{e}_R = 1/a$

  If left party wins: $\tilde{e}_L = \bar{\beta} + 1/a$

- Who wins? $\Pr ob(right\,wins) = P = \Pr ob\left(\beta_{med} < \frac{1}{a} + \frac{\bar{\beta}}{2} \right)$

- Expected inflation before elections:

$$E[\tilde{e}] = P\tilde{e}_R + (1-P)\tilde{e}_L$$

- Economic cycle (after elections):

  If right party wins: $\tilde{e} < E[\tilde{e}] \Rightarrow$ *recession*

  If left party wins: $\tilde{e} > E[\tilde{e}] \Rightarrow$ *boom*