



**Universidad de  
San Andrés**

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**DEPARTAMENTO DE ECONOMIA**

**THE  
POLITICS OF  
WAGE  
DECISIONS**

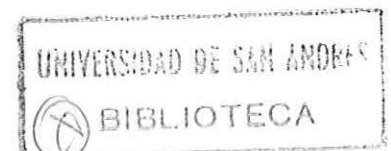
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CICLO DE SEMINARIOS 1993

Cuaderno 93/11

Día: Martes 22 de junio, 11 horas



Sem.  
Eco.  
93/13

SN 19016



Universidad de  
**San Andrés**

The politics of wage decisions

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Abstract I develop a political trade union model taking into consideration that the real wage depends both on the market and on the redistribution of income carried out through the political system. It is a two-period game between the government, that sets the exchange rate, and a trade union confederation, that sets wages. The main result is that, in a very polarized political climate, trade unions can cooperate with stabilization plans of labor governments, showing wage restraint, and they can harass instead the plans of non-labor governments, pushing inflation up with excessive wage demands.

1. Introduction

Trade unions can defend the economic interests of their members through direct negotiations with the employers, and also indirectly through the legislative process: the disposable income of workers determined by the market is affected by the taxes and expenditures decided at the political level. This has encouraged many trade unions to adopt an outright political affiliation, common in many countries in Europe and Latin America, and to support with funds and votes labor parties. Furthermore, trade unions can also undertake economic actions that have political repercussions, as it is apparent in the general strikes by the Peronist trade unions during the 1983-1989 Radical administration in Argentina. This leads to the idea of a political trade union model.

Given this fact, what impact do the political preferences of the trade union movement have on stabilization plans in

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<sup>1</sup>I thank George Akerlof and Alessandra Casella for their guidance, Matthew Rabin for his advice on game theory, Barry Eichengreen, Albert Fishlow, Torsten Persson, Robert Powell and Lloyd Ulman for their insightful observations, and Emilia Ghelfi for her encouragement.

I owe Gustavo Gonzaga and Mauricio Naranjo the references to Brazil and Mexico, respectively. I acknowledge the comments by Ricardo López Murphy, Juan Pablo Nicolini and Michele Santo to an earlier version presented at the 1992 Meeting of the Banco Central del Uruguay.

countries where they are influential in wage setting? Trade unions can cooperate -- or not -- with incomes policy attempts through the nominal wage demands they put forth. For example, the March 14, 1992 issue of *The Economist* refers to Fidel Velazquez, general secretary of the Mexican Workers Confederation (CTM): "In recent years, in the name of social peace, he has presided over wage cuts. Since 1987 the CTM has supported a social pact of wage and (some) price controls that has cut the official inflation rate from 159% to 19% last year." (p.49). This occurs in a context where the ties between trade unions and the PRI, the ruling party, are very close, since unions are guaranteed a fixed quota of elected offices, the control of the workers' housing fund, etc. To justify wage restraint, the head of the CTM states at the time of the social pact, shortly before the 1988 elections, that higher nominal wage increases would only lead to more inflation and a fall in real wages.

To model the political dimension of the trade union's wage decisions, I base it on two premises: first, low inflation and unemployment increase the probability of reelection of the incumbent government; second, two political parties, a labor and a non-labor party, compete for office and differ in their distributive policies. The incumbent party will obviously be interested in the success of a stabilization plan, since it increases its chances of being reelected. The trade union movement, however, is not always interested in the

success of the stabilization effort because it might assure the reelection of a non-friendly party.

Section Two introduces the elements of the political trade union model, and Section Three the underlying wage-price spiral. This leads to the core of the paper: Section Four formalizes the political incentives of the government and the trade union movement when elections depend on inflation and unemployment. Section Five reviews related literature. The last Section presents the conclusions.

## 2. The building blocks

Inflation, in the form of a wage-devaluation spiral, is modelled as a the result of a game between a central trade union and the government: the union controls wages and the government chooses the exchange rate. Firms and voters appear in the background. Firms take prices and wages as given when they make their production decisions, so they do not have a direct influence on inflationary outcomes. Voters' behavior is to reelect with lower probability a government that produces inflation and/or unemployment.

The per-period utility functions of each group are discussed in this Section. Expected utility over a multi-period horizon is simply an additive function of the individual periods, with a rate of time discount  $\delta$ ,  $0 \leq \delta \leq 1$ .

### i. Firms

Only one tradeable good is produced in a small open economy that is a price-taker in the international market. Normalizing foreign prices  $p^*$  to one, domestic prices  $p$  equal the exchange rate  $e$ .

Firms take both prices  $p$  and wages  $w$  as given. There is a flat tax rate  $\tau$  on profits. Labor  $l$  is the only input, and the production technology is Cobb-Douglas. Each firm chooses employment so as to maximize net profits  $b$ . Since the objective function is concave, an interior solution exists<sup>2</sup>.

$$\text{Max}_l b(l) = (1-\tau) \left( y - \frac{w}{e} l \right), \quad \text{where } y = l^\alpha, \quad 0 < \alpha < 1 \quad (1)$$

The first-order condition implies a labor-demand curve that is decreasing in the real wage  $w/e$ , or increasing in the real exchange rate  $e/w$ , i.e. the ratio of prices of tradables to non-tradables. Labor supply is assumed to be inelastic beyond the full-employment level.

$$l = \left( \alpha \frac{e}{w} \right)^{\frac{1}{1-\alpha}}, \quad \text{where } 0 \leq l \leq \bar{l}$$

The supply curve for goods is consequently an increasing function of the real exchange rate. Workers get a share  $\alpha$  of before-tax income, while entrepreneurs get  $1-\alpha$ .

#### ii. Government

The two main approaches to model economic policy

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<sup>2</sup>In this setup it is equivalent for firms to maximize net profits or the log of net profits. Entrepreneurs have a log utility function, as stated in the next Sub-section.

decisions by political parties are that either politicians are opportunistic and only want to win elections, or that politicians have their own ideologies and want to apply partisan policies (Cf. Alesina (1989), pp. 59f., and Nordhaus (1989), pp. 7ff.).<sup>3</sup> I follow the partisan approach, here each party has its own views on what distribution of income is desirable. The government's per-period utility is a weighted average of the utility of workers and entrepreneurs, and the weights depend on whether the incumbent is pro-worker (T) or not (NT)<sup>4</sup>. Each income group has a log utility function of income, where the after-tax income of wage-earners is denoted  $y_w$ , and that of profit-earners  $y_b$ .

$$\begin{aligned} \text{Max}_{y_w, y_b} v(y_w, y_b/i) &= \beta^i \ln(y_w) + (1-\beta^i) \ln(y_b) \\ \text{for } i \in \{T, NT\} \text{ s.t. } &y_w + y_b \leq y \end{aligned} \quad (2)$$

The government imposes income taxes to make transfers. It also sets the nominal exchange rate. Government policy is analyzed in a two-step process.

For a given income level, the government must decide how to split it up. The weights assigned by incumbent  $i$  to workers

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<sup>3</sup>Anthony Downs characterizes the first approach as "parties formulate policies in order to win elections", p. 28 of An economic theory of democracy, New York: Harper and Row, 1957. Donald Wittman sums up the second approach as "candidates view winning as a means to policy", p. 180 of "Candidates with policy preferences: a dynamic model", Journal of Economic Theory, vol. 14, no. 1, February 1977, so not only voter's preferences matter, parties' preferences do too.

<sup>4</sup>Transfers to the two political parties and the unemployed can be included, but would clutter the notation.



and entrepreneurs turn out to be their respective income shares:  $y_w^i = \beta^i y$ ,  $y_b^i = (1 - \beta^i) y$ . As long as  $\alpha \neq \beta^i$  one group subsidizes the other. Income redistribution is achieved through taxes and transfers. The transfers of government  $i$  to workers,  $t^i$ , equal the taxes on entrepreneurs<sup>5</sup>. The market shares of income are thus altered by the political system.

Who benefits depends on what political party is in power. The benchmark is when the two parties are strictly opposed on income distribution: the labor party wants to give a larger share of income to workers, assigning them a weight  $\beta$ , where  $\frac{1}{2} < \beta < 1$ , while the weights are reversed with the other party. This is the source of the political dynamics between the trade union and the political parties in Section Four<sup>6</sup>.

	<u>Share of disposable income</u>	
	Workers	Entrepreneurs
Party in office:		
Labor	$\beta$	$1 - \beta$
Non-labor	$1 - \beta$	$\beta$

Since a fixed share of income accrues to each interest

<sup>5</sup>If the transfers  $t^i = (\beta^i - \alpha)y$  to workers are positive, the implicit tax rate on profits is

$$\tau = \frac{t^i}{y - l(w/p)} = \frac{\beta^i - \alpha}{1 - \alpha}$$

If the transfers are negative, entrepreneurs receive an ad-valorem subsidy.

<sup>6</sup>It is also possible to look at what entrepreneurs do, but I would have to depart from a competitive setting.

group, the government's maximization problem can be rewritten in terms of aggregate income. Since income is a function of the real exchange rate, the second step of the government's optimization problem is to pick the optimal exchange rate, subject to the constraint of feasible output levels. This is at the root of the real wage conflict between the government and the central trade union in Section Three.

$$\begin{aligned} \text{Max}_e v\left(\frac{e}{w(e)} / i\right) &= \beta^i \ln(\beta^i) + (1-\beta^i) \ln(1-\beta^i) + \frac{\alpha}{1-\alpha} \ln\left(\alpha \frac{e}{w(e)}\right) \\ \text{s.t. } 0 &\leq \left(\alpha \frac{e}{w(e)}\right)^{\frac{1}{1-\alpha}} \leq \bar{l} \end{aligned}$$

### iii. Trade unions

According to the insider-outsider model, due to labor turnover costs the incumbent workers, i.e., the "insiders", enjoy precedence over entrants and outsiders when it comes to hiring decisions. Insiders can collude through their formal organization into a labor union, so I assume that insiders are the union members. Lindbeck and Snower (1988) list in pp. 82f ways in which a union can raise wages of insiders without reducing their chances of continued employment.

The central trade union is a monopoly trade union whose per-period utility depends on the total income of its members. Workers' income comes from wages  $w$  and government transfers  $t^1$  to employed workers. These transfers can be either positive or negative, i.e. payroll taxes. The union operates under the restriction of keeping all its members employed. The number of

union members  $m$  is exogenously given, and its role in this model is as a parameter for the degree of real wage conflict between incumbent government ( $i$ ) and trade unions.

$$\begin{aligned} \text{Max}_w u\left(\frac{w}{e(w)}/i\right) &= \ln\left(m\frac{w}{e(w)} + \frac{m}{l}t^i\right) = \ln\left(m\frac{\beta^i}{\alpha}\frac{w}{e(w)}\right) \\ \text{s.t. } m &\leq \left(\alpha\frac{e(w)}{w}\right)^{\frac{1}{1-\alpha}} \leq \bar{l} \end{aligned} \quad (3)$$

The political trade union model arises because the union can achieve its objectives through political channels. A historical precedent, mentioned in Fishbein (1984), pp. 229f, is given by the LO, the main Swedish central trade union federation, which in the early 1930s forsaked its traditional industrial strategy in favor of a political strategy. The Swedish unions had sought to defend the interests of their members through a strategy of militant collective bargaining, but with the accession of the Social Democratic party in 1932 the LO recognizes they could accomplish much more by supporting and lobbying the government than through strikes. The outgrowth of this political strategy is a wage restraint program, one of the features the model in Section Four tries to capture.

#### iv. Voters

Voters are not incorporated explicitly. The main simplification is that electoral outcomes do not depend on the distribution of income that parties on the right and the left favor, only on what happens to inflation  $\pi_t$  and unemployment

$u_t$  during the incumbent's term in office. They can be taken as measures of how competent the administration is.

Fair (1988) shows low inflation and high growth increase an incumbent's chances of winning U.S. presidential elections. High growth is in turn associated to low unemployment. In line with this, I assume the probability of reelection decreases with inflation and unemployment, once the reservation levels of inflation ( $\pi^*$ ) and unemployment ( $u^*$ ) are surpassed.

Probability of reelection

	$\pi \leq \pi^*$	$\pi > \pi^*$
$u \leq u^*$	1	r
$u > u^*$	s	sr

Note:  $r, s \in [0, 1]$

Since inflation equals devaluation and unemployment depends on the real wage, the reaction function of voters can be expressed in terms of an exchange rate index and the real exchange rate.

$$\pi_t = \frac{e_t}{e_{t-1}} - 1, \quad u_t = 1 - \frac{l_t}{l}, \quad \text{so probability} \tag{4}$$

*reelection is function*  $F\left(\frac{e_t}{e_{t-1}}, \frac{e_t}{w_t}\right) = F\left(\frac{e_t}{e_{t-1}}\right) F\left(\frac{e_t}{w_t}\right)$

Given the structure of the model, for a given nominal wage both types of government turn out to face the same decision problem, so their chances of reelection are in principle equal. Unions, however, can tilt the balance and force one government to devalue more by not restraining their initial nominal wage demands.

### 3. The wage-devaluation spiral

To disentangle the underlying issue of the wage-devaluation spiral from the political incentives, I first look at a setup without elections. The model is inspired by the wage-devaluation spiral in Horn-Persson (1988), and two alternative timings of wage and exchange rate adjustment are reviewed.<sup>7</sup>

The key issue is the real wage conflict between the trade union and the government, which is embodied in the model as a difference in target levels of employment: trade unions want a higher real wage than the government, or equivalently the government aims at a competitive real exchange rate that is more devalued than what the unions deem acceptable. This formalizes the idea in Flanagan, Soskice and Ulman (1983) that unions can prefer a combination of a higher real wage and higher unemployment than the authorities find acceptable, as long as the adverse effects do not fall on its members but rather on new entrants to the work force and other marginal groups (pp. 266, 269f).<sup>8</sup>

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<sup>7</sup>Tabellini (1988) also considers the problem of economic policy as a game between the government and a central trade union, instead of an atomistic private sector. The setting, however, is a closed economy.

<sup>8</sup>This need not be this way. Flanagan, Soskice and Ulman (1983) remark that the British Conservatives under Thatcher break in 1979 with past policies by using restrictive demand management to deliberately create a rate of unemployment substantially higher than the natural rate (p. 441). For the first time

With a slight modification the model can describe a balance of payments conflict: if government expenditures do not adjust fully to the swings in receipts, a lower real exchange rate leads to a lower level of income and to lower tax receipts. This means a budget deficit, which in this simplified one-commodity world is identical to a balance of payments deficit. I omit this here because it introduces a complicated inter-temporal debt dynamics that is not central to the analysis, though the conflict over the real exchange rate is related to the stop-go cycles that alternate between balance of payment deficits and devaluations.

i. Lags in the adjustment of exchange rates

The first timing pattern is with staggering. Unions change nominal wages in odd periods and the government changes exchange rates in even periods, as in Akerlof (1969)<sup>9</sup>. A wage-devaluation spiral arises: unions achieve their desired real wage in odd periods, the government in even ones.

First consider a stage game with two periods. In the second period the government takes wages as given and sets the exchange rate as high as possible, so a corner solution with full-employment is attained. In the first period the trade

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increasing unemployment seriously puts at risk the jobs of well organized workers, moderating wage increases by the second half of 1980 (p.439). In this instance unemployment is used to discipline the labor force.

<sup>9</sup>There it is a game between two rival trade unions involved in leapfrogging, here it is a game between the government and a centralized trade union.

union takes exchange rates as given and sets wages optimally. The result is also a corner solution: since trade unions strictly prefer all wages higher than the one that leads to full-employment, they aim at the highest real wage consistent with all union members being employed.

$$e_{t,2}^* = \frac{\bar{l}^{1-\alpha}}{\alpha} w_{t,1}, \quad w_{t,1}^* = \frac{\alpha}{m^{1-\alpha}} e_{t-1,2}$$

The conflict over the real wage implies a wage-devaluation spiral in the stage game: inflation over a two-period span is an increasing function of the discrepancy between the union's and the government's desired real wage.

$$\pi_t = \frac{(w_{t,1}/e_{t-1,2}) - (w_{t,1}/e_{t,2})}{w_{t,1}/e_{t,2}} = \left(\frac{\bar{l}}{m}\right)^{1-\alpha} - 1 \geq 0$$

This spiral is replicated if a finite multi-stage game is considered: unions raise nominal wages in odd periods, thus increasing real wages, while the government devalues in even periods, thus making the exchange rate more competitive.

#### ii. Exchange rates changed at discretion

Henceforth I drop the assumption that the government can only change exchange rates in even periods. With no staggering, each stage can be thought of as a single period, not two as in the previous Sub-section. While wages are signed into contracts, exchange rates can be changed at discretion.

With no elections, the incumbent will stay in office whatever the rate of inflation. Since wages are set before exchange rates, the incumbent is free to pursue its objective

of setting an exchange rate that leads to full-employment.

This result differs from Horn and Persson (1988), an open economy version of the credibility problem where exchange rates can be changed at discretion. There the trade unions are able to achieve their real wage objective at the expense of an inflationary bias because the government cares about inflation directly. Here the government only cares about inflation indirectly, insofar as it hurts its reelection prospects.

This alternative timing need not lead, by itself, to a wage-devaluation spiral: once trade unions realize the government is committed to a high real exchange rate, nominal wage hikes are useless. If there are any costs to changing wages, the result with complete information is low rather than high inflation. The electoral constraints of the next Section reintroduce the spiral.

#### 4. A political union model of wage decisions

The political consequences of wage and exchange rate decisions in the presence of elections are spelled out here. Some degree of political polarization is necessary. If the two parties do not have diverging ideological views, the union has no reason to prefer one party over the other. Furthermore, though the two political parties have no direct preferences for holding office, their divergent ideological views are enough to give them a reason to be reelected, since they must



stay in power to carry out these views.

Flanagan, Soskice and Ulman (1983), in their review of stabilization with incomes policy in nine European countries during, particularly, the 1970s, emphasize that the case for incomes policy is to thwart worker militancy, reduce real wages and unemployment, increase competitiveness and profitability, all of which run counter to the traditional union objectives. Therefore the policy has to offer a quid pro quo in other areas, either compensation for union members or institutional protection to unions (p. 37). In this Section union members receive a larger share of income with a friendly government, but sometimes it is more appropriate to talk instead of the benefits the union bureaucracy derives from cooperation with the government.

There are two subsections where a two-period model is analyzed. First, a change in party implies that distributive policies are reversed for sure in the second period. This is afterwards generalized to admit uncertainty about the government's true type, thus reducing the average degree of polarization.

#### i. Complete information

The starting point is the case where the labor party (L) applies pro-worker policies, while the non-labor party (NL) applies policies favorable to entrepreneurs.

The reservation level of inflation and unemployment is assumed to be zero, so if there is any inflation or any

unemployment the government's chances of reelection are diminished. As initial condition, the real wage is at full-employment level.

The two-period model can be solved by backwards induction. In the end period the government has no political constraints, so whatever party is in office devalues to attain full-employment. Trade unions cannot affect either real wages or future elections, so I assume they leave wages fixed. Plugging these values into both objective functions, they become a function exclusively of first period variables.

The government's behavior in the first period is described by the temptation to devalue: the benefits of achieving a more competitive exchange rate have to be contrasted to the costs in terms of lower probabilities of reelection. The situation where inflation leads the government to incur larger political costs than unemployment is considered<sup>10</sup>. This implies there exists a limit wage up to which the government is not willing to devalue. The union can assure a higher real wages if it does not push beyond that.

The trade union must consider the trade-off between achieving higher wages now and having a pro-worker government in office in the future. Its choice set can be reduced to

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<sup>10</sup>All proofs are given in the appendix. When unemployment creates greater political costs than inflation the results are trivial. The government will not allow the real wage to increase, so if unions raise nominal wages it will devalue for sure. The central trade union is only left with political incentives, so there will be no inflation with a labor government and positive inflation with a non-labor government.

three points: the initial wage, the target wage (the minimum of the government limit wage and the wage that corresponds to exclusive employment of union members), and any wage above the limit wage.

The solution concept is sub-game perfect equilibrium, where the union acts as a Stackelberg leader (figure 1 shows the game tree without payoffs). The union's actions are characterized by the following set of propositions, where cooperation refers to acceptance of a wage freeze and harassment to pushing wages beyond the limit wage.

Proposition 1: The trade union never harasses a labor government.

Remark. The trade union never exceeds the limit wage and forces a labor government to devalue because the only extra effect is to discredit the government and increase the chances of the non-labor party winning the elections.

Proposition 2: The trade union never cooperates with a non-labor government.

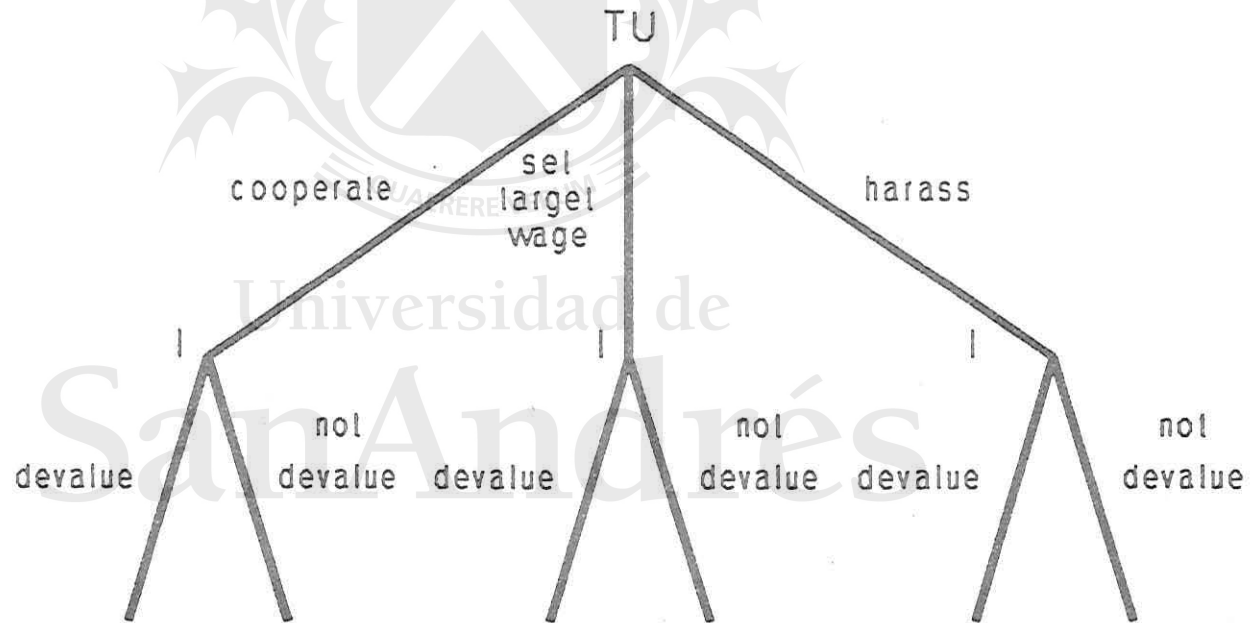
Remark. The trade union never accepts to freeze wages with a non-labor government because besides sacrificing real wages this assures with probability one the reelection of an incumbent that is adverse to trade unions.

Proposition 3: The trade union can cooperate with a labor government.

Remark. This implies taking a real wage cut to help the incumbent's electoral chances by decreasing unemployment.

Figure 1

Two-period game with complete information between trade union (TU) and government (I)



Proposition 4: The trade union can harass a non-labor government.

Remark. This implies taking a real wage cut to hurt the incumbent's electoral chances by increasing inflation.

In these propositions there is an interaction between the trade union and the government at two levels. Because of the conflict on the distribution of income, the trade union prefers a labor government, and it doesn't want a non-labor government. This is an incentive to not increase wages with a labor government and to push nominal wages beyond the limit wage with a non-labor government. If this were the only source of conflict the union would always cooperate with labor, and harass non-labor, governments.

This first effect is however tempered by the influence of the real wage conflict. The union knows any government tolerates up to a point higher real wages today to win the option of staying in office next period. This is an incentive for unions to be more aggressive with a labor government and less so with a non-labor government, so the outcome can be that with either government unions push wages to the target level, i.e., the highest level they can either achieve or wish. The government will delay devaluation until the second period, reproducing the wage-price spiral.

On the whole, labor market push can lead to lower inflation with a labor government, because of union cooperation with it, or harassment of non-labor governments.

ii. Incomplete information

The analysis of the previous subsection has to be qualified once there is incomplete information about the government and both pro-worker and pro-entrepreneur members co-exist in each party. The beliefs about each party are summarized by the probability that it is pro-worker (T) and assigns workers a weight  $\beta$ . The labor party has a reputation of being more pro-worker, and the odds are that a candidate from that party will apply policies favorable to the working class. The reverse is true for the non-labor party.

$$1 \geq \Pr(L=T) > 1/2 > \Pr(NL=T) \geq 0$$

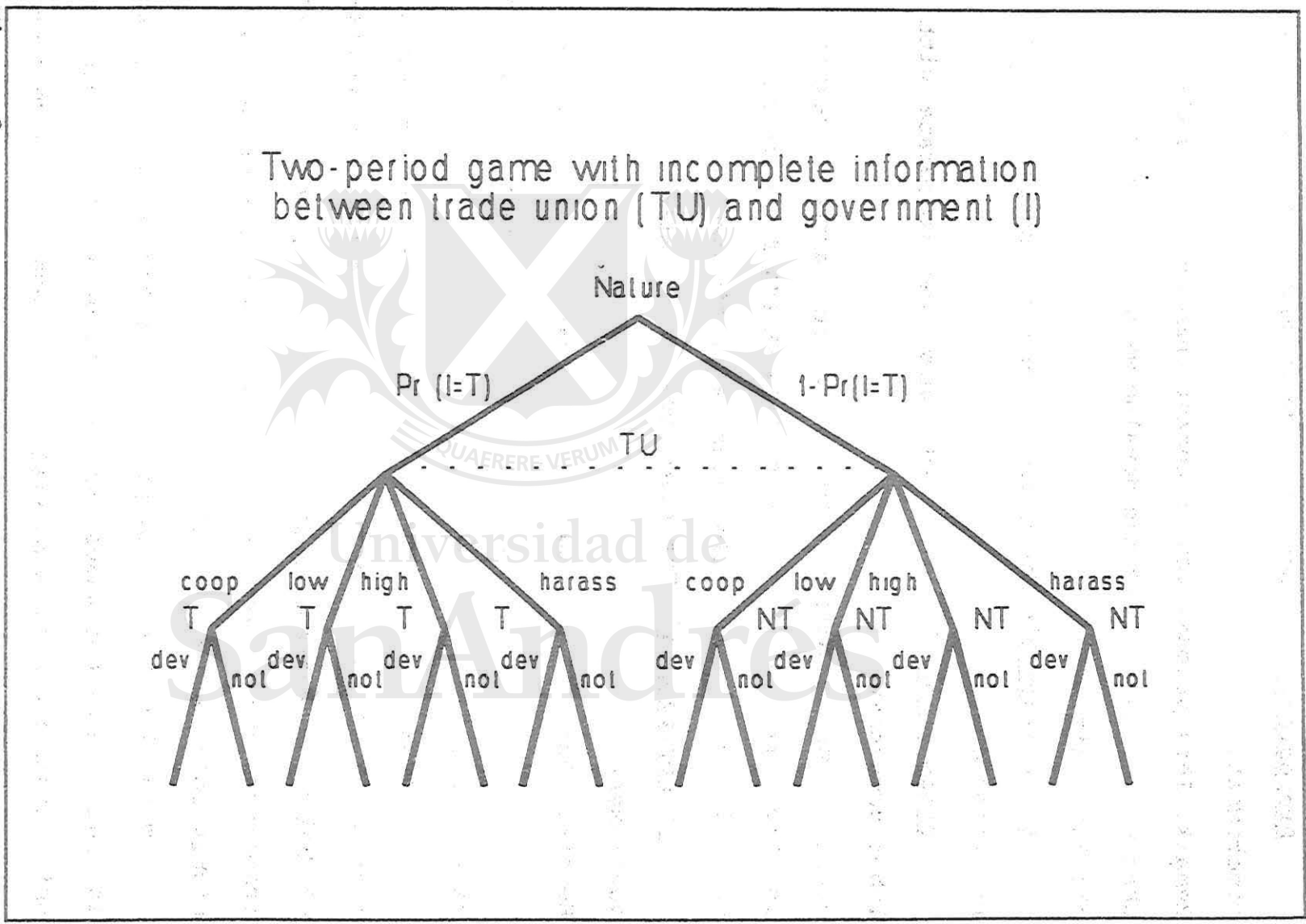
The average degree of political polarization depends, for a given  $\beta$  that describes the conflict over the distribution of income, on the relative reputation of both parties,  $\Pr(L=T) - \Pr(NL=T)$ . In the previous Sub-section the beliefs are that labor party is with probability one pro-worker, while the other party is pro-worker with zero probability.

A perfect Bayesian equilibrium is considered to generalize the results of the previous Sub-section to the case of incomplete information (figure 2 shows the game tree without the payoffs). Cooperation refers to acceptance of a wage freeze. There is a low and a high limit wage for each party, so harassment refers specifically to pushing wages beyond the high limit wage.<sup>11</sup>

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<sup>11</sup>All proofs are given in the appendix.

Figure 2



Proposition 1': The trade union never harasses a labor government.

Remark. This proposition is weaker than before, in the sense that a labor government can devalue when the wage is set above the low limit wage.

Proposition 2': The trade union never cooperates with a non-labor government.

Proposition 3': The trade union can cooperate with a labor government.

Remark. The conditions depend on the average degree of political polarization: as  $\Pr(L=T) - \Pr(NL=T)$  decreases, the possibility of cooperation eventually disappears.

Proposition 4': The trade union can harass a non-labor government.

Remark. Again, as the average degree of polarization decreases, the possibility of harassment eventually disappears.

According to the last two propositions, cooperation and harassment are impossible when the parties have a reputation of being on average close to each other. Hence, in this framework cooperation and harassment are the product of a highly polarized political system.

With little political polarization the choice is between low and high target wages. By Proposition 5' in appendix, the union tends to be more moderate with a non-labor government.



## 5. Literature on incomes policies

The political trade union model is now contrasted with the literature that addresses the role of the trade union movement's political affiliation on the dynamics of the wage-price spiral. On a more general level the model's message is that in a politically polarized atmosphere wage restraint is more probable with a labor government. More specifically, there are two sets of predictions: first, trade unions will never accept to freeze wages with a non-labor government, but it is possible for them to cooperate in that sense with a labor government; second, trade unions can be aggressive toward a non-labor government and deliberately push inflation up with their wage demands, but they will not do that with a labor government.

My main reference is Ulman and Flanagan (1971), who focus on the dilemma between full employment and price stability in the context of free collective bargaining. The use of incomes policy to improve the trade-off by restraining the behavior of organized labor and large-scale enterprise is analyzed in seven European countries. The tendency is to emphasize wage restraint as an indirect approach to price stability, though especially in France direct price controls were used (p. 6). Ulman and Flanagan carefully review the proposition that unions cooperate with incomes policy only if political parties closely allied to the dominant labor groups are in power,

which in Europe means the Social Democrats, as a corollary of the wider proposition that union cooperation with incomes policy requires that the government enjoy the confidence of the unions (p. 56).

In Great Britain, unions refused to exercise wage restraint with Conservative governments in 1956 and 1961 despite serious balance of payments problems, while they accepted it with Labor governments in 1948 and 1965 (pp. 16f). Econometric studies show that incomes policy induces wage restraint during periods of Labor -- but not Conservative -- governments (pp. 23f). Nevertheless, the British experience also shows that a Socialist government is not sufficient for continued union support, and it can end in wage explosions (pp. 16, 29ff). The pattern that unions refuse to exercise wage restraint with Conservative governments and accept it with Labor governments is also observed in Netherlands (pp. 56f, 61f), Denmark (pp. 140 ff) and Germany (pp. 185ff; pp. 194ff cover wildcat strikes against policy of wage restraint with Social Democrats).

This pattern is already encountered by Edelman and Fleming (1965), who study the politics of wage-price decisions in four countries in the 1948-1963 period. Governmental intervention in union and management decisions is more significant in Great Britain and the Netherlands, that suffer recurrent balance of payment deficits, than in Germany and Italy (pp. 281f). There is an overlap between unions and labor

parties: in Great Britain and the Netherlands unions consistently worked for wage restraint when labor governments were in power, and for relatively short time periods they won the support of their members to help the government cope with balance of payments deficits (pp. 312f). In Great Britain the Labor government persuaded the trade unions to observe a wage pause between 1948 and 1950, while in 1963 a Conservative government could not get the cooperation of the trade unions: since trade unions formed the backbone of the Labor party's support, Edelman and Fleming do not find this pattern surprising (p. 286). In the Netherlands, in 1951 and again in 1957 the trade unions accepted cuts in real wages in the face of balance of payments difficulties, in the second case suffering a decline in membership (p. 290). This is mainly the result of the dominant Socialist trade union federation, which only reversed its position of support for centralized wage guidance after the Labor party went into opposition in 1959 (p. 252).

The fact that trade unions can (temporarily) moderate wage demands, accepting real wage cuts to help a socialist government, though not a conservative one, control balance of payment problems and inflation, is related to the set of propositions on cooperation. By Proposition 3 in Section Four unions can cooperate with a socialist government and take real wage cuts to decrease unemployment, increasing in this way the government's electoral chances, while by Proposition 2 unions

will never cooperate in this way with a conservative government.

Flanagan, Soskice and Ulman (1983) point out that the nominal incomes policies of the 1960s often ended up failing even in the case of unions with close political ties to the incumbent political party because they did not provide significant rewards for sustained wage restraint; this led to the erosion of the authority of the national union officials over the rank and file, and in several countries the response to the reduction in real wages was grass-roots revolt, wildcat strikes and wage explosions (p.4). The breakdown of union cooperation is not captured by the two-period model, but it could be done in a model where reputation is endogenous.

In relation to the breakdown of union cooperation, Flanagan, Soskice and Ulman (1983) contrast the role of the Social Democrats in Germany with that of the Labor party in Great Britain. The Social Democrats, who entered the ruling coalition in 1966 and led the government between 1969 and 1983, had a moderating influence on unions: in 1967 they launched an initiative of concerted action with both sides of industry, which lasted formally until 1977, when the trade union confederation pulled out, but intensive unofficial contacts with union leaders continued (pp. 280, 285, 294). Despite the shocks of the 1970s, wage restraint by unions contributed to the continuation of a strong economic

performance (pp. 286, 296ff).<sup>12</sup> In exchange, with the Social Democratic led government a great increase in social security transfer payments occurred in the 1970s and representation of workers and unions on supervisory boards was increased under the Codetermination Act of 1976 (p. 294). This performance contrasts with that of the Labor governments in Great Britain. The Labor party in Great Britain had reached a social contract with unions before the 1974 election, to mend the relations deteriorated during the 1964/70 Wilson government due to attempts at restrictive labor legislation (pp. 394, 418ff). After the failure of voluntary wage restraint, in a sequence similar to the 1966 freeze, the Wilson-Callaghan government proposed an incomes policy in 1975: the trade unions cooperated because they see wage restraint as necessary to keep Labor in office, fearing a future electoral victory by a Conservative party that was moving to the right (pp. 430f). The period from mid 1975 to mid 1978 was the only long period of effective incomes policy (pp. 370, 424). The incomes policy, however, collapsed in late 1978 with a wave of strikes by public sector employees whose relative pay had fallen behind, and this swamped Labor's electoral chances (p 436).

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<sup>12</sup>Flanagan, Soskice and Ulman (1983), pp. 269 and 275f, underline the existence of an independent central bank whose commitment to monetary discipline receives the highest priority, but the limitations of the central bank to secure price stability under fixed rates of exchange (because money supply is endogenous due to capital flows) and high-level employment under floating rates of exchange (when money supply can be controlled by central bank) lend an important role to trade unions.

Though legislation was pro-union during this period, by 1976 Labor lost a small majority in Commons and was not able to enact laws on industrial democracy (pp. 420ff). The Labor government was not fully capable of keeping its end of the social contract.

Ulman and Flanagan (1971) mention two episodes that follow a second pattern, the waves of strikes and wage explosions in France in 1968 (pp. 152f, 170) and Italy in 1969 (pp. 213f). They call this "negative incomes policy" (p. 229), where politically oriented labor movements use wage hikes as a pressure to destabilize conservative governments. This resembles the set of propositions on harassment. By Proposition 4 it is possible for unions to push inflation up, taking a cut in real wages, to hurt a conservative government's electoral chances, while by Proposition 1 this will not happen with a socialist government.

The experience of the Heath administration in Great Britain, covered in Flanagan, Soskice and Ulman (1983), can also be interpreted as a case of harassment in a highly polarized political climate. In 1970 the Conservatives broke with the policy of tacit cooperation with unions they had followed between 1951 and 1964, enacting restrictive labor legislation and recurring to deflationary policies (pp. 374ff). They made a U-turn in 1972, attempting incomes policy to reduce inflation, but the miners defied it: though Heath charged that the strike was a politically motivated effort,

and the public opinion recognized this, the 1974 elections, held as a referendum on who rules Great Britain, ended with the loss of the Conservatives (pp. 415ff). The other unions supported the miners, unlike 1958 when they had abandoned the militant bus strikers to their own luck: back then the Trade Union Congress had supported "reasonableness in the formulation of wage claims" and had urged the government, in private, not to concede (pp. 377, 380f, 418).

The phenomena of cooperation and harassment can also be observed in Latin-American countries. Unlike Europe, labor parties cannot be described as socialist but rather as nationalist and populist. In Argentina, where labor and non-labor governments can be translated as Peronist and non-Peronist governments, trade unions tend to (more or less) voluntarily cooperate with stabilization plans during Peronist governments, exercising wage restraint. The 1952 stabilization plan, the 1973/75 Social Pact (which, however, ended in a wage explosion), and the Convertibility plan launched in 1991 witness this. Mallon and Sourrouille (1975) refer to the first episode, an inflationary spiral that reached its peak in 1951, with increases of 37% in the CPI and 48% in the WPI. Combined with a disastrous drought that jeopardized the balance of payments, this convinced the government to adopt an austerity program in February 1952: "Perón encountered no major obstacle in obtaining cooperation from his labor constituency, which had been the main intended beneficiary of his original

policies and formed the backbone of his political party. A National Commission for Prices and Wages was set up, a system of two-year wage contracts was introduced, and further wage increases were substantially scaled down, with the result that the annual rate of inflation was reduced to about 4% by 1954" (p. 12). Price controls were also used vigorously, as well as official subsidies to food and public services.

The pattern that trade unions do not cooperate with stabilization plans during non-Peronist governments, and sometimes openly undermine these efforts, is also present. For example, the 1963/66 Radical government was harassed by the Peronist labor unions, and labor difficulties contributed to polarize opposition against the government: "... the reluctance of President Illia to call out the troops to prevent occupation of factories, sabotage and other acts of labor violence convinced employers that it would be more prudent to follow a line of less resistance. The wage-price spiral therefore accelerated..." (Mallon and Sourrouille (1975), p.29).

Amadeo and Camargo (1988) talk about Brazil. In 1978 there was a reemergence of labor activism, which was reinforced after the change to a civilian government in 1985, with the end of the repression unions suffered under military rule. The fact that there was no social compromise at the political level, and poor working conditions at the firm level, led the CUT, one of the labor federations, to develop



strong political links to the PT, an opposition labor party, transforming many of its demands into important political issues in Parliament. It also led to union militancy, which spread out from the industrial sectors of São Paulo to the rest of the country. This was one of the factors at the root of acceleration of inflation: in response to the pressure of the labor movement, the adjustment period of wages was reduced from 1 year to six months, and then to one month in 1988/9. My reading is that in contrast to the current stabilization programs in Mexico and Argentina, in Brazil the government has not been able to count on the cooperation of the labor movement to carry out the stabilization plans. It could be likened to the experience of the 1983/89 Alfonsín administration in Argentina, where in a situation of great political polarization the trade unions harassed government stabilization plans.

## 6. Concluding remarks

It is commonplace to characterize labor parties as being more inflationary than non-labor parties, but this overlooks an important phenomenon. I take the opposite approach: labor parties can be more successful with stabilization programs. In this paper neither political party has a larger inflationary bias, so the key to this explanation is the behavior of the labor unions.

The model builds on a fact also stressed by Ulman and Flanagan (1971), that it is easier for a labor party to enjoy the trust of trade unions. This is formalized in a two-period model where the outcome of elections depends on inflation and unemployment and the labor party has a reputation of being more pro-worker than the non-labor party. In a situation of high political polarization it is possible for a labor government to count on union cooperation to moderate inflation, while trade unions might on the contrary push inflation up with their wage demands under non-labor governments. In the final analysis inflation can be fueled by political polarization precisely because society sees it as undesirable.



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## Appendix

The proofs of the Propositions in Section Four are presented below. The per-period functions are as described in Section Two. Any additional assumptions are specifically marked.

i. The two-period model with complete information

Problem: the monetary authority picks the optimal exchange rate for each period once wages have already been set. Since the probability of reelection depends on inflation and unemployment, the government's maximization problem is a function of both the rate of devaluation and the real exchange rate. By symmetry the income shares are exactly reversed with a switch in the ruling party, so the expected utility of the incumbent government is not conditional on its identity being either labor or non-labor.

$$\begin{aligned} \text{Max}_{e_1, e_2} EV\left(\frac{e_1}{w_1}, \frac{e_2}{w_2}, \frac{e_1}{e_0}\right) &= c(\beta) + \eta \ln\left(\alpha \frac{e_1}{w_1}\right) \\ &+ \delta \left( \bar{c}(\beta) + \eta \ln\left(\alpha \frac{e_2}{w_2}\right) + F\left(\frac{e_1}{e_0}, \frac{e_1}{w_1}\right) \lambda \right), \end{aligned}$$

$$\text{where } \eta = \frac{\alpha}{1-\alpha}, \quad \lambda = (2\beta-1) \ln\left(\frac{\beta}{1-\beta}\right),$$

$$\bar{c}(\beta) = \beta \ln(1-\beta) + (1-\beta) \ln(\beta) < \beta \ln(\beta) + (1-\beta) \ln(1-\beta) = c(\beta)$$

The trade union's intertemporal expected utility depends on the government's reaction to its nominal wages, and on the share of income the incumbent party  $i$  and the opposition  $o$  allot to workers (weighed by the probability each will be in office).

$$\begin{aligned} \text{Max}_{w_1, w_2} EU\left(\frac{w_1}{e_1(w_1)}, \frac{w_2}{e_2(w_2)}, \frac{e_1(w_1)}{e_0} / i\right) &= \ln\left(m \frac{\beta^i}{\alpha} \frac{w_1}{e_1(w_1)}\right) \\ &+ \delta \left[ \ln\left(m \frac{\beta^o}{\alpha} \frac{w_2}{e_2(w_2)}\right) + F\left(\frac{e_1(w_1)}{e_0}, \frac{e_1(w_1)}{w_1}\right) \ln\left(\frac{\beta^i}{\beta^o}\right) \right] \end{aligned}$$

Additional assumptions: (A1) The reservation levels of inflation and unemployment are zero, i.e.  $\pi^* = 0$  and  $u^* = 0$ ; (A2) The initial real wage  $w_0/e_0$  is the full employment real wage; (A3) The trade union keeps wages frozen in the second period (otherwise the nominal wage is indeterminate in the end-period).

Solution: in the second period there are no electoral constraints, so the government will set the exchange rate at the full-employment level. By (A3) unions do not hike wages in the last period.

$$e_2^* = \frac{\bar{l}^{1-\alpha}}{\alpha} w_2, \quad w_2^* = w_1$$

The second-period solutions can be substituted into the agents' objective functions. The government's problem in the first period is only a function of the current exchange rate.

$$\begin{aligned} \text{Max}_{e_1} \text{EV} \left( \frac{e_1}{w_1}, \frac{\bar{l}^{1-\alpha}}{\alpha}, \frac{e_1}{e_0} \right) &= c(\beta) + \eta \ln \left( \alpha \frac{e_1}{w_1} \right) \\ &+ \delta (\bar{c}(\beta) + \alpha \ln(\bar{l}) + F \left( \frac{e_1}{e_0}, \frac{e_1}{w_1} \right) \lambda) \end{aligned}$$

To describe the behavior of the government, a function  $D(w_1)$  can be defined as the difference between the government's expected utility at the full-employment exchange rate and at the original exchange rate. It can be called the temptation to devalue (since a devaluation leads the government to incur a fixed political cost, once it decides to devalue it aims at full employment).

$$\begin{aligned} D(w_1) &= \text{EV} \left( \frac{\bar{l}^{1-\alpha}}{\alpha}, \frac{\bar{l}^{1-\alpha}}{\alpha}, \frac{w_1}{w_0} \right) - \text{EV} \left( \frac{e_0}{w_1}, \frac{\bar{l}^{1-\alpha}}{\alpha}, 1 \right) \\ &= \eta \ln \left( \frac{\bar{l}^{1-\alpha}/\alpha}{e_0/w_1} \right) + \delta \left[ F \left( \frac{w_1}{w_0}, \frac{\bar{l}^{1-\alpha}}{\alpha} \right) - F \left( 1, \frac{e_0}{w_1} \right) \right] \lambda \end{aligned}$$

The temptation to devalue can be broken down in two terms. The first gives the benefit of a devaluation, which comes through the increase in output provoked by an increase in the real exchange rate. The second is the political cost of a devaluation, which can be positive or negative according to whether or not inflation is politically more costly than unemployment. By (A2), the temptation to devalue will be zero if  $w_1 = w_0$ . Once current wages exceed past wages, the temptation to devalue can be reexpressed more compactly.

$$D(w_1) = \eta \ln \left( \frac{w_1}{w_0} \right) + \delta (r-s) \lambda$$

The first term of  $D(w_1)$  is positive. When unemployment is politically more costly than inflation ( $r > s$ ), so is the second. The solution is then straightforward: the government will not tolerate any deviations at all in the real exchange rate. The trade union is only left with political incentives, so there will be no inflation with a labor government and positive inflation with a non-labor government.

The case considered from now on is when inflation is

politically more costly than unemployment ( $r < s$ ), so the second term is negative.  $D(w_1)$  is increasing in  $w_1$ , being initially negative but then reaching a point where the government is just indifferent between devaluing or not. This defines a limit wage  $w$  bar.

$$\ln\left(\frac{\bar{w}_1}{e_0}\right) = \ln\left(\frac{\alpha}{\bar{l}^{1-\alpha}}\right) + \delta(s-r) \frac{\lambda}{\eta}$$

The union is the first to move, so its problem depends on the exchange rate it expects the government to set. It acts strategically taking the government's reaction into account.

$$\begin{aligned} \text{Max}_{w_1} EU\left(\frac{w_1}{e_1(w_1)}, \frac{\alpha}{\bar{l}^{1-\alpha}}, \frac{e_1(w_1)}{e_0}/i\right) &= \ln\left(m \frac{\beta^i}{\alpha} \frac{w_1}{e_1(w_1)}\right) \\ &+ \delta \left[ \ln\left(\frac{m}{\bar{l}^{1-\alpha}} \beta^0\right) + F\left(\frac{e_1(w_1)}{e_0}, \frac{e_1(w_1)}{w_1}\right) \ln\left(\frac{\beta^i}{\beta^0}\right) \right] \end{aligned}$$

The trade union is capable of securing higher real wages in the first period as long as it doesn't push wages beyond the threshold given by the limit wage. Since unemployment imposes a fixed political cost on the government, as long as it keeps all its members employed the union will prefer that wage to any other wage in between this and the initial wage. This allows to define the union's highest target wage  $w$  hat as the minimum of the government limit wage and what can be called  $w$  star, the wage that corresponds to the exclusive employment of union members.

$$\hat{w}_1 = \min(\bar{w}_1, w_1^*), \quad \text{where } w_1^* = \frac{\alpha}{m^{1-\alpha}} e_0$$

Since inflation causes the government a fixed political cost, the trade union needs to evaluate expected utility at only three points: the initial wage, the target wage, and any arbitrary wage  $w_1^+$  above the limit wage. To make the notation concise, let the difference in expected utility at two alternative first period wages  $a$  and  $b$  be  $R^i(w_1^a, w_1^b)$ .

$$\begin{aligned} R^i(w_1^a, w_1^b) &= \\ &= EU\left(\frac{w_1^a}{e_1(w_1^a)}, \frac{\alpha}{\bar{l}^{1-\alpha}}, \frac{e_1(w_1^a)}{e_0}/i\right) - EU\left(\frac{w_1^b}{e_1(w_1^b)}, \frac{\alpha}{\bar{l}^{1-\alpha}}, \frac{e_1(w_1^b)}{e_0}/i\right) \\ &= \ln \frac{w_1^a/e_1(w_1^a)}{w_1^b/e_1(w_1^b)} + \delta \left[ F\left(\frac{e_1(w_1^a)}{e_0}, \frac{e_1(w_1^a)}{w_1^a}\right) - F\left(\frac{e_1(w_1^b)}{e_0}, \frac{e_1(w_1^b)}{w_1^b}\right) \right] \ln \frac{\beta^i}{\beta^0} \end{aligned}$$

The expression  $R^1(w_1^a, w_1^b)$  has two parts, first the real wages, second the political costs or benefits, implied by different nominal wages. In a series of propositions I establish that the behavior of the trade union depends on what party i controls the government. The term cooperation refers to accepting a wage freeze, harassment to hiking wages beyond the limit wage.

Proposition 1: The trade union never harasses a labor government.

Pf. Only need to show unions prefer some other wage, e.g. the initial wage.

$$R^L(w_0, w_1^*) - \delta(1-r) \ln\left(\frac{\beta}{1-\beta}\right) > 0$$

Proposition 2: The trade union never cooperates with a non-labor government.

Pf. Unions prefer wage that forces government to devalue.

$$R^{NL}(w_0, w_1^*) - \delta(1-r) \ln\left(\frac{\beta}{1-\beta}\right) < 0$$

Proposition 3: The trade union can cooperate with a labor government.

Pf. The union prefers to freeze wages when the gains from hiking wages are not larger than the concomitant political costs, so expected utility at the initial wage is higher than at wage  $w$  hat. This imposes an upper bound on the target wage:  $w$  hat is the minimum of the government limit wage and wage  $w$  star, so this is equivalent to the condition that one of these two wages satisfy the upper bound.

$$\text{cooperation} \Leftrightarrow R^L(w_0, \hat{w}_1) - \ln\left(\frac{w_0/e_0}{\hat{w}_1/e_0}\right) + \delta(1-s) \ln\left(\frac{\beta}{1-\beta}\right) \geq 0$$

$$\therefore \text{cooperation} \Leftrightarrow 2\beta - 1 \leq \eta \frac{1-s}{s-r} \vee \ln\left(\frac{\bar{I}}{m}\right)^{1-\alpha} \leq \delta(1-s) \ln\left(\frac{\beta}{1-\beta}\right)$$

Proposition 4: The trade union can harass a non-labor government.

Pf. The union prefers to force the government to devalue when the political benefits the union reaps are larger than losses from a lower real wage. This imposes an upper bound on the target wage, equivalent to having either the limit wage or wage  $w$  star satisfy this bound. (Note: if  $\alpha \geq \frac{1}{2}$ , so real wage elasticity of output is high, harassment is only outcome).

$$\text{harassment} \Leftrightarrow R^{NL}(\hat{w}_1, w_1^*) - \ln\left(\frac{\hat{w}_1/e_0}{\alpha/\bar{I}^{1-\alpha}}\right) - \delta(s-r)\ln\left(\frac{\beta}{1-\beta}\right) < 0$$

$$\therefore \text{harassment} \Leftrightarrow 2\beta - 1 < \eta \vee \ln\left(\frac{\bar{I}}{m}\right)^{1-\alpha} < \delta(s-r)\ln\left(\frac{\beta}{1-\beta}\right)$$

Cooperation and harassment are less likely for large values of the full-employment/union membership ratio, which indicates a high degree of wage conflict. When the conditions for propositions 3 and 4 are not satisfied, the trade union aims at the highest target wage regardless of the incumbent. This leads to a modified version of the spiral with staggering in Section Three: the union increases wages in the first period, while the government delays devaluation until the second period because of electoral constraints.

More generally parties not only differ in ideology (the parameter beta), they are also motivated to keep power because of a direct self-interest in their share of government revenue (which can be called gamma): the incumbent party gets a larger share than the opposition<sup>13</sup>. If this source of political polarization is more severe than the conflict over the distribution of income, the first two propositions stand unchanged, while both cooperation with a labor party and harassment of a non-labor party are less likely since the sacrifice of real wages required to achieve political objectives of trade unions is larger. If there were no ideological differences at all, the trade union would never push wages beyond limit wage. For a positive reservation rate of inflation -- unlike our assumption (A1) -- this reduces to the models with credibility problems, since if the government cannot credibly commit to not devalue the only consistent outcome is with positive inflation.

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<sup>13</sup>Say the government's per-period objective function is a weighted average of the utility of the two political parties (with a weight of rho) and of workers and entrepreneurs (with a weight of one minus rho). If incumbent gets a share gamma of funds for political parties, while the opposition gets the rest, the limit wage is

$$\ln\left(\frac{\bar{w}_1}{e_0}\right) = \ln\left(\frac{\alpha}{\bar{I}^{1-\alpha}}\right) + \delta \frac{s-r}{\eta} \left( (1-\rho)\lambda + \rho(2\gamma-1)\ln\left(\frac{\gamma}{1-\gamma}\right) \right)$$

If gamma=beta it boils down to limit wage in text, but when the main driving force of political party is desire for power (gamma larger than beta) this limit wage is larger.

ii. The two-period model with incomplete information

The incumbent government's expected utility depends now on its type being pro-worker or not, and also on what party is in office because the probability the opposition will apply the same policies is not assumed to be symmetric.

$$\begin{aligned} \text{Max}_{e_1} EV\left(\frac{e_1}{w_1}, \frac{\bar{I}^{1-\alpha}}{\alpha}, \frac{e_1}{e_0}/i, j\right) &= c(\beta) + \eta \ln\left(\alpha \frac{e_1}{w_1}\right) \\ &+ \delta [\bar{c}(\beta) + \alpha \ln(\bar{I}) + (Q^{i,j} + F\left(\frac{e_1}{e_0}, \frac{e_1}{w_1}\right) (1 - Q^{i,j})) \lambda], \end{aligned}$$

where  $i \in \{L, NL\}$ ,  $j \in \{T, NT\}$ ,

$Q^{i,j}$  is probability party  $i$ 's opposition has same type  $j$

For each party there is not one limit wage but rather two. When the labor party governs, a pro-worker type tolerates higher real wages because a reversal of policies is likely with the opposition ( $Q^{L,T} \leq 1/2$ ). When the non-labor party is in office a pro-entrepreneur type tolerates higher real wages, again by the assumptions in text about beliefs ( $Q^{NL,NT} \leq 1/2$ ).

For  $i \in \{L, NL\}$ ,  $j \in \{T, NT\}$ ,

$$\ln\left(\frac{\bar{w}_1^{i,j}}{e_0}\right) = \ln\left(\frac{\alpha}{\bar{I}^{1-\alpha}}\right) + \delta (s-r) (1 - Q^{i,j}) \frac{\lambda}{\eta}$$

The possible government reactions to a given nominal wage are not uniquely defined, being conditional on the incumbent's type. The union's expected utility depends in the first period on the likelihood that the incumbent is pro-worker or not, and in the second period on the likelihood that each party is pro-worker, weighed by the corresponding probability it will hold office. This whole expression can be reduced to three lines: a constant term, a term given by the expected (log of the) real wage in the first period, and a last term given by the probability of policies favorable to the working classes in the second period.



$$\begin{aligned} \text{Max}_{w_1} EU(\cdot/i) &= \ln(m \frac{1-\beta}{\alpha}) + Pr(i=T) \ln(\frac{\beta}{1-\beta}) + \delta \ln(m \frac{1-\beta}{I^{1-\alpha}}) \\ &+ Pr(i=T) \ln(\frac{w_1}{e_1^T(w_1)}) + (1-Pr(i=T)) \ln(\frac{w_1}{e_1^{NT}(w_1)}) \\ &+ \delta [Pr(i=T) F(\frac{e_1^T(w_1)}{e_0}, \frac{e_1^T(w_1)}{w_1}) + Pr(i=T) (1-F(w_1))] \ln(\frac{\beta}{1-\beta}), \end{aligned}$$

$$\begin{aligned} \text{where } F(w_1) &= Pr(i=T) F(\frac{e_1^T(w_1)}{e_0}, \frac{e_1^T(w_1)}{w_1}) \\ &+ (1-Pr(i=T)) F(\frac{e_1^{NT}(w_1)}{e_0}, \frac{e_1^{NT}(w_1)}{w_1}) \end{aligned}$$

The highest target wage  $w_1^*$  that the union can aim at is the minimum of the high limit wage and union's wage  $w^*$ . The union can avoid the risk the government might devalue by setting a lower wage, namely the minimum of the low limit wage and the union's target wage. The union's expected utility thus only needs to be evaluated at four points: the initial wage, the low target wage, the high target wage, and an arbitrary nominal wage  $w_1^*$  above the high limit wage.

$$\text{For } i \in \{L, NL\} \quad w_1 \in \{w_0, \hat{w}_1^{i,NT}, \hat{w}_1^{i,T}, w_1^*\},$$

$$\text{where } \hat{w}_1^{i,NT} = \min(\bar{w}_1^{i,NT}, w_1^*) \quad \wedge \quad \hat{w}_1^{i,T} = \min(\bar{w}_1^{i,T}, w_1^*)$$

The propositions of the previous subsection are generalized to the case of imperfect information. The degree of political polarization does not only depend on the conflict over the distribution of income between the two types, but also on the relative reputation of both parties,  $Pr(L=T) - Pr(NL=T)$ , where the labor party has the reputation of being on average pro-labor and the other of being favorable to entrepreneurs. The term cooperation stands as before, while harassment refers to pushing wages above the high limit wage.

Proposition 1\* The trade union never harasses a labor government.

Pf. It is enough to show that at least another wage is preferred to  $w_1^*$ . Note the labor government can be forced to devalue when the administration is not pro-worker, so in this sense the result is weaker than before.

$$R^L(w_0, w_1^*) = \delta(1-r) (Pr(L=T) - Pr(NL=T)) \ln(\frac{\beta}{1-\beta}) > 0$$

Proposition 2\* The trade union never cooperates with a non-labor government.

Pf. The union prefers  $w_1^*$  (or the low target wage) to the initial wage.

$$R^{NL}(w_0, w_1^*) = -\delta(1-r)(Pr(L=T) - Pr(NL=T)) \ln\left(\frac{\beta}{1-\beta}\right) < 0$$

Proposition 3\* The trade union can cooperate with a labor government.

Pf. The procedure is the same as in proposition 3, except for fact that union must compare initial wage to both target wages.

$$\text{cooperation} \Leftrightarrow R^L(w_0, \hat{w}_1^{L,NT}) \geq 0 \wedge R^L(w_0, \hat{w}_1^{L,T}) \geq 0$$

$$R^L(w_0, \hat{w}_1^{L,NT}) \geq 0 \Leftrightarrow a \vee b, \text{ where}$$

$$a: 2\beta - 1 \leq \eta \frac{Pr(L=T) - Pr(NL=T)}{Pr(NL=T)} \frac{1-s}{s-r}$$

$$b: \ln\left(\frac{\bar{I}}{m}\right)^{1-\alpha} \leq \delta(Pr(L=T) - Pr(NL=T)) (1-s) \ln\left(\frac{\beta}{1-\beta}\right)$$

$$R^L(w_0, \hat{w}_1^{L,T}) \geq 0 \Leftrightarrow c \vee d, \text{ where}$$

$$c: 2\beta - 1 \leq \eta \left[ \frac{Pr(L=T) - Pr(NL=T)}{Pr(L=T)(1-Pr(NL=T))} \frac{1-s}{s-r} - \frac{Pr(NL=T)(1-Pr(L=T))}{Pr(L=T)(1-Pr(NL=T))} \right]$$

$$d: \ln\left(\frac{\bar{I}}{m}\right)^{1-\alpha} \leq \delta \left[ \frac{Pr(L=T) - Pr(NL=T)}{Pr(L=T)} (1-s) - \frac{Pr(NL=T)(1-Pr(L=T))}{Pr(L=T)} (s-r) \right] \ln\left(\frac{\beta}{1-\beta}\right)$$

Proposition 4\* The trade union can harass a non-labor government.

Pf. Union must compare option of harassment to the two target wages.

$$\text{harassment} \Leftrightarrow R^{NL}(\hat{w}_1^{NL,T}, w_1^*) < 0 \wedge R^{NL}(\hat{w}_1^{NL,NT}, w_1^*) < 0$$

$$\therefore \text{harassment} \Leftrightarrow (a \vee b) \wedge (c \vee d) \Leftrightarrow (a \wedge (c \vee d)) \vee b,$$

$$\text{where } a: 2\beta - 1 < \eta \frac{Pr(L=T) - Pr(NL=T)}{1-Pr(L=T)},$$

$$b: \ln\left(\frac{\bar{I}}{m}\right)^{1-\alpha} < \delta(Pr(L=T) - Pr(NL=T)) (s-r) \ln\left(\frac{\beta}{1-\beta}\right),$$

$$c: 2\beta - 1 < \eta, \quad d: \ln\left(\frac{\bar{I}}{m}\right)^{1-\alpha} < \delta Pr(L=T) (s-r) \ln\left(\frac{\beta}{1-\beta}\right)$$

In relation to Propositions 3' and 4', when there is complete polarization the conditions are the same as Propositions 3 and 4. When the situation tends to a low average degree of polarization both cooperation and harassment become impossible. In this instance it remains to determine whether the union will prefer the low or the high target wage.

Proposition 5' When there is a low degree of political polarization, the union is likely to show a greater degree of restraint with a non-labor government.

Pf. There are several degrees of restraint, of which the most extreme is a wage freeze. With low polarization this is impossible, so the low and high feasible wages (which are different when there is a high degree of wage conflict and union wage  $w^*$  is not binding) have to be compared. Taking the symmetrical case  $\Pr(L=T)=1-\Pr(NL=T)$ , in the two expressions below the first two terms are equal, while the third differs in sign. Since it is positive for a labor government, the high target wage is comparatively more attractive when labor party is incumbent.

$$R^L(\hat{w}_1^{L,T}, \hat{w}_1^{L,NT}) = \Pr(L=T) \ln\left(\frac{\hat{w}_1^{L,T}/e_0}{\hat{w}_1^{L,NT}/e_0}\right) - (1-\Pr(L=T)) \ln\left(\frac{\hat{w}_1^{L,NT}/e_0}{\alpha/\bar{l}^{1-\alpha}}\right) \\ + \delta \Pr(NL=T) (1-\Pr(L=T)) (s-r) \ln\left(\frac{\beta}{1-\beta}\right)$$

$$R^{NL}(\hat{w}_1^{NL,NT}, \hat{w}_1^{NL,T}) = (1-\Pr(NL=T)) \ln\left(\frac{\hat{w}_1^{NL,NT}/e_0}{\hat{w}_1^{NL,T}/e_0}\right) \\ - \Pr(NL=T) \ln\left(\frac{\hat{w}_1^{NL,T}/e_0}{\alpha/\bar{l}^{1-\alpha}}\right) - \delta \Pr(NL=T) (1-\Pr(L=T)) (s-r) \ln\left(\frac{\beta}{1-\beta}\right)$$

This result is basically due to the fact that when the low limit wage is surpassed, the anti-worker incumbent is sorted out with labor government, but with non-labor government the pro-worker incumbent is sorted out.

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