

INTEREST GROUPS AND AN (IN)ELEGANT MODEL OF INFLATION

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Abstract: The baseline model of existing theories of inflation ignores a very important aspect of the political reality in democracies: public policies can create special interest groups who vie for and compete against each other to influence public policies. Since inflation is a *public good* and has large and concentrated effects, formation of special interests groups is very likely. Since rent-seeking activities of these special interest groups impact on incentives and temper constraints of a government, the analysis of inflation theory of existing models, without any footing in interest group politics, is at best incomplete, if not misconstrued. A critical problem of the literature is serious difficulties in modelling interest group formation. To circumvent this weakness we model group formation by offering an endogenous determination of *coalition* of voters, which acts as a political constituency of an incumbent government. In order to do that we develop a rent-seeking game in which special interest groups spend real resources to temper inflation in their favour. By so doing we also provide, for the first time in the literature, an endogenous determination of inflation targets of different interest groups. This is important since the endogenization of inflation targets allows us to model a *circular interdependence* that has been consistently neglected in the literature on inflation theory: inflationary experience affects real economy and, thereby, voters' evaluation of the government whilst this evaluation constrains government's behaviour that, in turn, affects inflation which further influences voters' evaluation. From this circular interdependence we model the formation of coalitions of voters that lend political support to the incumbent government. In the perfect Nash equilibrium of the proposed game, the incumbent government announces and adopts the equilibrium inflation rate that shapes voters' evaluations and triggers an equilibrium coalition of voters. The equilibrium coalition of voters from diverse interest groups, in turn, maximises the probability of re-election of this incumbent. We find that the equilibrium inflation is not unique, thus there is indeterminacy in the choice of an optimal inflation policy. We find that the proposed game has two equilibria: a zero-inflation equilibrium and a non-zero-inflation equilibrium. Given the history (or expectations) of low, or zero inflation rates, the zero-inflation equilibrium gets chosen. This equilibrium inflation policy is shown to be unaffected by business cycles and political factors that characterise an economy. On the other hand, if the non-zero-inflation equilibrium gets chosen due to history, or expectations, of high rates of inflation; the non-zero-inflation equilibrium depends critically on the political landscape of the society. We also find that the non-zero-inflation equilibrium is counter-cyclical. We also find that conservative governments - quite contrary to Alesina's important finding - can have a larger inflationary bias vis-à-vis a socialist government, if the non-zero-inflation equilibrium gets chosen. One may thus argue that if there is a history of low inflation (or, low inflationary expectations), the equilibrium inflationary policy of a conservative government is identical to the equilibrium inflationary policy of a socialist government (convergence of inflationary policies). The divergence arises only when actual inflation, or inflationary expectation, is high. Contrary to the received doctrine, in such a scenario, the conservatives have an incentive to inflate more than the socialists.

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1. Introduction:

Elegant models of have been constructed to understand incentives and constraints of governments in choosing inflation optimally. It is well understood, as these models persuasively argue that governments have limited ability to pre-commit to price stability (Kydland and Prescott, 1977; Barro and Gordon, 1983). In a discretionary monetary policy regime in which nominal wages are fixed over a certain period, the government has an incentive to create surprise inflation in order to reduce real wages for stimulating employment and output. However, a rational wage setter understands this incentive and incorporates this in one's wage demand. As a result, there is no surprise inflation and no employment/output gain; but only an excessively high inflation that is a product of a Pareto-inferior Nash equilibrium. This Pareto-inferior Nash equilibrium of a one-shot game gives rise to what is commonly known as inflationary bias. However, when the game gets repeated Backus and Driffill (1985) established the possibility that the inflationary bias can disappear.

Application of this approach has led to the development of even more elegant and even more persuasive models such as the partisan model of inflation (Alesina, 1987). The partisan model of inflation starts off with the assumption that political parties entertain different preferences for inflation and unemployment. The party that is relatively more averse to unemployment will have stronger incentives to inflate. It is exogenous to the model how and why political parties have come to acquire their preferences over inflation and unemployment. It is also supposed that socialist parties care more for unemployment and, therefore, have stronger incentives to inflate vis-à-vis conservative parties. If wage-setters can anticipate this incentive of socialist parties, the wage rate will be accordingly adjusted and there will be little impact on unemployment. Thus, socialist parties will be associated with higher expected and actual inflation than conservatives, although neither will be able to impact on unemployment systematically. All these models have received considerable and

favourable attention as being elegant, persuasive and in some cases decisive in burying debates in the theory of inflation. Why does a rational agent then waste his time, emotion and efforts in constructing another model to explain the theory of inflation? In our understanding the literature has some serious gaps that motivate this current model.

First and foremost, all these models are based on a baseline model of political theory rooted in a democracy. Voters have two entitlements: in a democracy each voter has the entitlement to returns from one's economic activities. As a voter s/he has an entitlement to influence the inflation rate by casting one's vote in favour of, or against, an incumbent government in elections. The actual inflation, in turn, affects their economic returns. It is assumed that each voter exercises the voting right in one's self interests. A rational and incumbent government then chooses the optimal inflation rate that will give rise to nominal returns to voters that will, in turn, maximise votes cast in favour of the incumbent government. Voters are thus assumed to have a single means to shape/influence public policies - that is through their ballots in elections. This baseline model ignores a very important aspect of the political reality in democracies: public policies can create special interest groups who vie for and compete against each other to influence public policies. If costs and benefits of public policies are concentrated on certain groups, they have an incentive to form special interest groups in order to influence public policies to advance their sectarian and common interests. Since inflation is a *public good* and has large and concentrated effects, formation of special interests groups is very likely. Since rent-seeking activities of these special interest groups impact on incentives and temper constraints of a government, the analysis of inflation theory of these elegant models, without any footing in interest group politics, is at best incomplete, if not misconstrued.

The very contribution of this paper is to model interest group politics in the context of inflation theory. We develop a rent-seeking game in which special interest groups spend real resources to temper inflation in their favour. How important is this game in the literature on inflation

theory? Persson, Roland and Tabellini (1998) observe¹:

“The voters' interest and the possible conflicts among them are generally disregarded and political institutions do not play any part in the analysis” (p. 686).

Interest groups are ubiquitous and an important characteristic of our modern democratic systems. Interest groups offer contributions to political parties, endorse candidates and convey crucial information to the public and politicians. It enables citizens to better monitor and hold their governments accountable and lend transparency and efficiency to governance and also offer social equity (see Sen, 1999; Edward, 1999). Extensive surveys of the literature are available in Grossman and Helpmand (2001); van Widen (1999) and Austen-Smith (1997)². A critical problem of the literature is serious difficulties in modelling interest group formation (Olson, 1965; Bergstrom, Blume and Varian, 1986; Rabin, 1993; Ostrom, 2000). It is only recently that Mitra (1999) presents a model in which the number of interest groups is determined endogenously. In this paper we will model group formation by offering an endogenous determination of a *coalition* of voters, which acts as a political constituency of an incumbent government. This paper will thus extend the literature on interest group formation.

The second contribution of this paper derives from the mechanics of the proposed rent-seeking game: in the existing models (e.g. Alesina and Cukierman, 1990; Alesina, 1987), voters' preferences are independent of government policy. In the literature on public policy preferences of special interest groups are exogenously determined and are the ideal preferences (see Cubitt, 1997). Cubitt argues,

‘...that the “target” postulated by a quadratic utility function should not be interpreted as

¹ How does government mitigate the conflict of interest among different groups of voters? This question, though important, has been ignored by the dominant models of public finance (see Persson, Roland and Tabellini, 1998 for their views). The neoclassical tradition assumes a benevolent Pigovian planner who maximizes a well-defined social welfare function. Positive public choice theory, on the other hand, assumes a malevolent Leviathan government that is induced by “stabilization”, “opportunistic” and “partisan motives” and, hence, solely maximizes one's own rent.

² The literature can be decomposed into four broad categories in which interest groups have been extensively researched: first, groups are considered as a means to categorise individuals. Secondly, groups are believed to enforce norms. Thirdly, groups are believed to influence upon policy making. Finally, groups are meant to

targets in any real sense. They are arbitrary constants whose role is to allow the objective function to represent preferences with appropriate properties in a particular zone.’ (pp. 175)

In this paper we provide an endogenous determination of inflation targets of different special interest groups. This is important since the endogenization of inflation targets allows us to model a *circular interdependence* that has been consistently neglected in the literature on inflation theory: inflationary experience affects real economy and, thereby, voters’ evaluation of the government whilst this evaluation constrains government’s behaviour that, in turn, affects inflation which further influences voters’ evaluation. From this circular interdependence we model the formation of coalitions of voters that lend political support to the incumbent government. In the perfect Nash equilibrium of the proposed two-stage game, the incumbent announces and adopts the equilibrium inflation rate that shapes voters’ evaluations and triggers an equilibrium coalition of voters. The equilibrium coalition of voters from diverse interest groups, in turn, maximises the probability of re-election of the incumbent. This is an important departure since governments can *strategically* use inflation to influence voters’ behaviour.

The partisan models stress that political parties harbour different and exogenous preferences for inflation and unemployment that, in turn, determine the relative aversion to unemployment of a political party. The party that is more averse to unemployment (say, socialists) will have stronger incentive to inflate. On the other hand, if conservatives are more averse to unemployment then socialists will have stronger incentives to inflate³. Unfortunately, there is no convincing argument in these elegant models to explain which party (socialists, or conservatives) is more averse to unemployment. Our final contribution is to offer an endogenous model to explain the relative unemployment-aversion of a political party. We show how political characteristics can influence unemployment-aversion of political parties. We establish that conservatives in equilibrium will be more averse to unemployment than socialists if a randomly chosen uncommitted (swing) voter from

transmit crucial information.

employers is more likely to vote for conservatives than a randomly chosen uncommitted voter (swing) from employed workers⁴.

Two polar views have emerged in the context of wage setting. On the one hand, the standard literature on trade unions assumes that wage contracts can be carried out conditional on the realisation of any economy-wide shocks, or subject to costless renege (see Farber, 1986, Oswald, 1985). As a result, there is complete real rigidity in the labour market that renders inflation completely ineffectual in reducing unemployment. On the other hand, Gray (1976, 1978), Fischer (1977), Cukierman (1980), Benassy (1995) have advanced models to explain optimal indexation in which trade unions choose a wage schedule with pre-specified degree of indexation of wages on prices⁵. In this paper we assume away the possibility of complete indexation that paves the way for inflation to reduce the aggregate wage pressure and, thereby, to increase employment. This is possibly most inelegant aspect of the proposed model of this paper. However, as Benassy (1995) observes,

“This feature (complete indexation) is clearly unrealistic as contracts are typically signed for a period of time during which many shocks occur without renegotiation and are not explicitly dependent upon all these shocks” (p. 635).

Thus, inflation - *with partial indexation* - obviously benefits the unemployed at the expense of the employed since it causes real wages to decline. Firms/employers also benefit from reduced labour

³ The argument is overtly simple: if a party has more aversion to unemployment, the party will attempt to reduce unemployment by creating surprise inflation.

⁴ Our model voting has antecedents in the literature: Lindbeck and Weibull (1987) and Dixit and Londregan (1994) adapted the probabilistic model to examine public policies that redistribute income to narrow groups of voters. They assume that the various groups differ in their preferences for the political parties and, thereby, identify political characteristics of a group that make it an ideal candidate for receiving political largesse. These authors highlight the major determinants of the political success of a special interest group. In a similar vein, our model establishes the political characteristics in terms of sensitivities of uncommitted (swing) voters that will make a group an ideal candidate for receiving political largesse of inflation from the incumbent government. As these political sensitivities of swing voters differ for different incumbent political parties, we show that these political parties will have different degrees of aversion to unemployment and, hence, have different incentives to inflate.

⁵ Benassy (1995) demonstrates that complete indexation will be sub-optimal for the trade unions when there is uncertainty about future events and it is impossible to condition wages on every state of the world.

costs. The primary intuition of this paper is that inflation has public good characteristics that can influence the formation of interest groups⁶. The fundamental premise of this paper, therefore, is that the inflationary process in advanced nations is a negotiated process between various interest/lobby groups who may spend real resources to control inflation rate in their individual favours. Some of these interest groups also have strong political clout to influence public policies, e.g. inflation. The government may also derive certain direct benefits from inflation and employment⁷. The incumbent government thus has an “*electoral motive*” to achieve a mix of inflation and employment that will maximise votes for its political survival. In this paper we develop a model to determine the equilibrium inflation as the outcome of strategic interactions between several interest groups and the incumbent government. This project is an important task for public choice and also for understanding the inflationary process.

The findings are three-fold: first, we demonstrate that the equilibrium inflation of the proposed game will pivot on the political landscape of a society. Secondly, the equilibrium inflation is shown to be counter-cyclical. Finally, a conservative government can have an inflationary bias. The first two findings are in consonance with the existing literature. The third finding contradicts an important finding of Alesina (1987). The plan of the paper is as follows: in Section 2 we provide the model and also present the rent-seeking game. In Section 3 we examine the voting paradigm and endogenously determine the equilibrium inflation rate from the vote maximising behaviour of the government. We finally conclude in Section 4.

2. The Model

⁶In models of intertemporal wage setting a distinction is made between employed insiders vis-a-vis unemployed outsiders and actual wage and employment derive from the competition between these interest groups (see Shapiro and Stiglitz, 1984, Layard and Nickell, 1987, Manning, 1991 and 1993, Calmfors and Lang, 1995).

⁷If one takes seigniorage as a tax on people’s money-holding, then inflation creates the additional benefits of seigniorage as the residual tax that merely adjusts to meet the budget constraint of the government (see Mankiw, 1987, Poterba and Rotemberg, 1990). In this paper we ignore this seigniorage motive of inflation to keep the

2.A. An Outline:

We postulate that the voters come from three dominant interest groups - namely, owners of firms, employed insiders and unemployed outsiders. In our model we postulate that the owners of firms are represented by a pre-existing industrial lobby. In a similar vein, employed workers are represented by an economy-wide union and are, hence, called the employed insiders. The unemployed job-seekers have little influence on the union and, hence, are called unemployed outsiders. In our model we postulate that at a point in time the union is a lobbying group only for employed insiders. Thus there are two powerful lobbies, or interest groups, whose interests are mutually opposed. We develop a two-stage game to determine the *equilibrium inflation* from the strategic interaction of these lobbies in a simple voting mechanism.

We assume a highly stylised game that is played over two stages. It is assumed that wage negotiations take place before the unfolding of the game. We make this assumption to bypass the possibility of complete indexation. At the first stage, or Stage I, the government announces the inflation rate which, if actualises, determines the real wages - given the incomplete indexation of nominal wages - at Stage II. A decline in real wages thus leads to increases in employment and output. Both owners of firms and unemployed outsiders gain at the expense of the employed insiders from such a decline in real wages. At Stage II these lobbies/interest groups engage in a rent-seeking game to influence the actual inflation rate. The Nash equilibrium of the rent-seeking game determines the inflation target of each lobby/interest group (hereafter interest group)⁸. As actual inflation diverges from the inflation target of a specific interest group, more and more voters from this interest group will withdraw electoral support from the incumbent government wherefrom an electoral

analysis tractable. The results will be unaffected if we introduce this additional motivation.

⁸In the standard models such preferences of interest groups are exogenously determined and are the ideal preferences (see Cubitt, 1997). Cubitt argues, "...that the 'target' postulated by a quadratic utility function should not be interpreted as targets in any real sense. They are arbitrary constants whose role is to allow the objective function to represent preferences with appropriate properties in a particular zone" (pp. 175). In this paper we provide an endogenous determination of the inflation targets that are also influenced by the constraints coming from other players and from the underlying general economic conditions.

outcome will emerge.

We assume that the union has a real-wage target and, hence, the union dislikes inflation. One commonplace assumption is that the union has a zero inflation target (see Lockwood and Philippopoulos, 1994). We allow the union to have a positive inflation target (see Cubitt, 1997, Gylfason and Lindbeck, 1994, Skott, 1997 for the rationale). We endogenously derive the inflation target that the union will accept given the wage indexation rule. The employed insiders - led by the union - will lobby for a rate within this bound. Similarly we derive the *endogenous inflation targets*, from the proposed rent-seeking game, of the industrial lobby. As the announced inflation rate exceeds the inflation target of the union, the political support of the employed insiders to the incumbent government will decline as the real-wage will fall below the target real-wage rate. Similarly, other two groups will reduce their support to the incumbent government if the announced inflation falls short of their inflation targets. At Stage II, thus, an electoral outcome is formed given the *announced* inflation rate at Stage I, inflation targets of the interest groups formed at Stage II, and rent-seeking activities of these interest groups. The rational expectations equilibrium of the rent-seeking game and the actual inflation rate will jointly determine the electoral outcome. The inflation announcement at Stage I thus has dual effects: first, it affects the inflation targets of the interest group by affecting the Nash equilibrium of the rent-seeking game. Secondly, the divergence between the announced inflation rate and the inflation target of an interest group will determine electoral support/votes from this interest group for the incumbent government and, hence the electoral outcome.

The incumbent government will maximise votes at Stage II by *strategically* choosing the inflation rate at Stage I given the expected Nash equilibrium of the rent-seeking game and the electoral outcome of Stage II⁹. If information is complete, in the relevant rational expectations

⁹We postulate that the optimal inflation is announced in Stage I and chosen before the electoral platform is formed. We, thereby, evade the time-inconsistency problem. Alternatively, one can develop a three-stage game to push our arguments through. At Stage I inflation is announced and at Stage II actual inflation materializes from rent seeking activities whilst at Stage III the electoral platform is formed. We simplify the game by assuming two stages. However, we will not lose any analytical bite with the postulated two-stage game.

equilibrium all the agents correctly predict the Nash equilibrium of the rent-seeking game wherefrom the overall equilibrium evolves. In order to solve the game we shall apply the logic of backward induction: we start with Stage II and characterise the Nash equilibrium of the rent-seeking game. Rationality and complete information ensure that all agents would form their expectations by looking ahead and foreseeing the rent-seeking outcome. If agents behave this way, they are said to have rational expectations. At Stage I the incumbent chooses the equilibrium inflation based on the rational expectations of the outcome of the rent-seeking activities and voters' behaviour. The resultant inflation is the solution to the proposed sequential game - known as a perfect Nash equilibrium (PNE) - which is the overall Nash equilibrium of the two-stage game. The perfect Nash equilibrium inflation rate allows the incumbent to achieve an equilibrium electoral outcome that maximises the votes and, thereby, the probability of its re-election.

2.B. A Simple Macrostructure:

In order to make the model tractable we assume a very elementary macrostructure consisting of three types of agents, namely, employed insiders/workers, unemployed outsiders and employers/firms. The prototype economy unfolds just for a period: before the game unfurls, the union - representing the insiders - and the industrial lobby - representing the owners of firms enter into a wage contract that determines the nominal wage rate w and the economy-wide employment L^* . The nominal wage w remains constant and the union represents the insiders L^* . We do not model w and L^* . The game has two stages as described in sub-section 2.A: at Stage I government announces inflation and at Stage II inflation targets and electoral equilibrium are formed.

Firms/employers will employ extra workers, above L^* , and produce extra output if and only if inflation, I , is positive. *Ceteris paribus*, an increase in inflation increases profits of the owner of firms. On the other hand, an increase in inflation reduces real wages and adversely affects the welfare of the employed insiders. An increase in inflation, however, increases employment and, hence, benefits the unemployed outsiders. Thus, the main intuition is that the industrial lobby has an

incentive to lobby for higher inflation while the union has an incentive to lobby for lower inflation. We assume that the unemployed outsiders do not have sufficient political clout/economic means to engage in costly lobbying. Inflation, thus, naturally entails conflict of interests among different groups of voters. We now address this conflict:

(a) Employed Insiders and the Union

Employed insiders consume and derive utility from a private good x while they dislike inflation and we label inflation as I . The budget constraint is as follows:

$$P^0x = Y - Ix \quad (1a)$$

Y : Nominal wage income and is given by

$$Y = wL^* \quad (1b)$$

L^* : economy-wide employment, w : nominal wage rate and P^0 : initial price level, I : inflation rate.

We write their utility function, Ω , as

$$\Omega = \Omega(x) = \Omega(wL^*/(P^0 + I)) \quad (1c)$$

where $d\Omega/dx = \Omega' > 0$, $\Omega'' \leq 0$ and $d\Omega/dI < 0$. Note that 'I' is a change in the price level, which becomes the inflation rate for $P^0 = 1$. While solving the game we will set $P^0 = 1$ and 'I' will be the inflation rate.

(b) Owners of Firms and Industrial Lobby

We write the profits of owners of firms as:

$$\Theta = (P^0 + I)(x + \Delta x) - w(L^* + \Delta L) \quad (1d)$$

Θ : Profits, I : Inflation rate where $d\Theta/dI > 0$ and Δx represents an increase in output.

(c) Unemployed Outsiders

The unemployed receive the benefit B and their consumption/utility function U is given as:

$$U = U(B) \quad (2a)$$

U has the usual properties of a utility function and we assume that B is completely indexed to inflation.

2.C. Rent-Seeking Through Lobbying In Stage II: Union versus Industrial

Lobby

The union represents the employed insiders and will spend effort/resources “**a**” to reduce inflation since inflation reduces real-wage rate. If victorious, they will reduce inflation to zero. The industrial lobby will spend effort/resources “**b**” to increase inflation and, if successful, inflation will be I . We define the outcome function, $r(a,b)$, of lobbying as the following:

Definition 1: We define $r(a,b)$ as the probability that the union - representing the employed insiders - succeed in achieving zero inflation. Similarly, we define $1-r(a,b)$ as the probability that the industrial lobby succeed in achieving inflation I given the nominal wage rate. We impose the following regularity conditions on $r(a,b)$:

$$r_a > 0 \text{ and } r_b < 0 \quad (2b)$$

$$r_{aa}, r_{bb} < 0 \quad (2c)$$

The Reaction Function of the Union:

The union attempts to maximise the expected value of consumption of an employed insider by increasing the real-wage rate. In so doing, the union influences the probability of reducing inflation $r(a,b)$ given the nominal wage rate. To put it in simple form, the union’s objective is given by the following optimization scheme:

$$\text{Maximise}_{\{a\}} \quad r(a,b) \Omega((w-a)/P^0 L^*) + [(1-r(a,b))] \Omega((w-a)/(P^0+I) L^*) \quad (2d)$$

The first order condition to maximise the expected value of consumption yields:

$$\begin{aligned} r_a [\Omega((w-a)/P^0 L^*) - \Omega((w-a)/(P^0+I) L^*)] \\ - L^* \Omega' [r/P^0 - (1+r)/(P^0+I)] = 0 \end{aligned} \quad (3a)$$

For simplification of calculations we linearise the utility function as:

$$\Omega((w-a)L^*/P^0) = \alpha((w-a)/P^0 L^*) \quad (3b)$$

$$\text{or,} \quad \Omega((w-a)L^*/(P^0+I)) = \alpha((w-a)L^*/(P^0+I)) \quad (3c)$$

Hence
$$\Omega'(\cdot) = \alpha \text{ and } \Omega'' = 0 \quad (3d)$$

Substituting equations (3b), (3c) and (3d) into equation (3a) yields:

$$r_a (w-a) I/[P^0(P^0+I)] - [(rI - P^0)/[P^0(P^0+I)]] = 0 \quad (4a)$$

From here we obtain the reaction function of the union as the following:

$$r_a(w-a)I - rI - P^0 = 0 \quad (4b)$$

The Reaction Function of the Industrial Lobby:

The industrial lobby attempts to maximise the expected profits of firms and the economic problem of the industrial lobby is reduced to the following optimisation exercise:

Maximise
$$r(a,b) [P^0x - wL^* - b] + (1-r(a,b))[(P^0 + I)(x + \Delta x) - w(L^* + \Delta) - b] \quad (4c)$$

 {b}

The first order condition to maximise (4c) with respect to b would yield the following reaction functions for the firms:

$$1 + r_b[Ix + (P^0 + I)\Delta x - w\Delta L] = 0 \quad (4d)$$

Since profit-maximisation implies:

$$(P^0 + I)\Delta x - w\Delta L = 0 \quad (4e)$$

Hence
$$1 + r_b Ix = 0 \quad (4f)$$

2.D. Nash Equilibrium of the Rent-Seeking Game at Stage II and Inflation

Targets:

The rent-seeking game can be reduced to a pair of reaction functions of the firms and the union - representing the employed insiders. The reaction functions are:

$$r_a (w-a)I - rI - P^0 = 0 \quad (4b)$$

$$1 + r_b Ix = 0 \quad (4f)$$

The Nash equilibrium of the rent-seeking game represents the values of a and b, say (a*,b*) that simultaneously solve the reaction functions of the firms and the union. Since the reaction functions

are implicit functions, we cannot directly solve for a^* and b^* . From the equation system (4b) and (4f) it is possible to derive the relevant derivatives, or direction of changes. One possible way to overcome this difficulty is to impose functional restrictions from which one can derive the precise Nash equilibrium of the proposed game. In order to simplify, we assume the following function to describe the probability function $r(a,b)$:

$$r(a,b) = a/b \quad (5a)$$

Hence we know: $r_a = 1/b$, $r_b = -a/b^2$ and $r_{ab} < 0$, $r_{ba} < 0$, we also assume $a < b$.

Substituting these functional forms in (4b) we get:

$$b^* = (xP^0)/4 + [(x^2(P^0)^2 + 8Ixw)^{1/2}] \quad (5b)$$

Substituting the above into (4f) yields:

$$a^* = w/2 + [P^0/(2I)]b^* \quad (5c)$$

Definition 2: We define a^* as the *inflation target* of the union representing the employed insiders. One may like to call a^* inflation tolerance. Employed insiders will tolerate inflation till a^* - without reducing their support to the incumbent government. The moment $I > a^*$, the employed workers/insiders gradually reduce electoral support to the incumbent government.

Definition 3: Similarly we define b^* as the *inflation target* of the industrial lobby. When $I < b^*$ the owners of firms will gradually withdraw electoral support to the incumbent government.

Observation 1: It is instructive to note that inflation targets a^* and b^* are endogenous and sensitive to the actual inflationary experience. Unlike the present paper, the existing literature assumes inflation targets to be exogenous. The endogeneity allows the incumbent government to strategically use inflation to influence electoral outcome. It is also instructive to note that the union increases (decreases) the inflationary target if the industrial lobby increases (decreases) its target inflation since:

$$da^*/db^* > 0 \quad (6a)$$

It is also important to note that b^* takes two values, the lower value is negative if inflation is positive

and hence we choose the larger value which is always positive and given by equation (5b). There is an important twist here: the lower value of b^* becomes zero if inflation rate is zero. From this property we will establish the existence of multiple equilibria and indeterminacy.

3.A. Electoral Motive of the Incumbent Government and Formation of Voters' Coalition

There are three distinct groups of voters, or interest groups, that comprise the society in our prototype model: the group of employed insiders/workers (group A), the group of owners of firms/employers (group B) and the group of unemployed outsiders (group C). Voters from these three groups offer their votes to a political party in an election. Thus an incumbent government is simply a coalition of voters who have cast their ballots in favour of the incumbent government in the previous election. The electoral motive of the incumbent is to coalesce the coalition of voters by the choice of an appropriate inflation policy to enhance its probability of re-election. We now explain how such a coalition of voters is formed in the subsequent rounds of elections. We ignore the question of manipulation of information (see Gangopadhyay, 2004).

We extend the probabilistic voting theorem to derive the electoral equilibrium (see Usher, 1994; Gangopadhyay, 20002). Towards this end, we consider 3 interest groups of voters: group 1 represents voters from owners of firms represented by the industrial lobby. Group 2 is formed by voters from employed insiders represented by the union. Group 3 is the collection of unemployed workers. We define λ_1 , λ_2 and λ_3 as the numbers of voters in interest groups 1, 2 and 3 respectively who vote for the incumbent in response to inflation. The incumbent creates inflation that in turn determines income shares of the groups and, hence, sets the electoral platform. The total votes, V (or an electoral platform), cast in favour of the incumbent is:

$$V = (\lambda_1 + \lambda_2 + \lambda_3) \tag{7b}$$

We postulate the following voting behaviour:

$$\lambda_1 = S_1 N_1 (I - b^*) + h_1 \quad (7c)$$

As the inflation exceeds the *inflation target* of owners of firms, b^* , more and more voters from group 1 will offer electoral support to the incumbent. The term h_1 denotes the committed votes from group 1 to the incumbent government and N_1 is the size of group 1. In the above equation, S_1 is the sensitivity parameter of the owners of firms. In other words, S_1 is the probability that a randomly chosen owner of firms from the uncommitted voters will vote for the incumbent¹⁰. We define λ_2 in an analogous fashion as:

$$\lambda_2 = h_2 + S_2 N_2 (a^* - I) \quad (7d)$$

Note h_2 is the committed votes from group 2, and N_2 and S_2 are the group size and sensitivity parameter of members of group 2, who tolerate inflation till a^* . Beyond a^* , members of this group start withdrawing electoral support from the incumbent. Similarly, for the unemployed outsiders (group 3):

$$\lambda_3 = h_3 + S_3 N_3 I \quad (7e)$$

h_3 is the committed votes of the unemployed to the incumbent government, S_3 and N_3 are the sensitivity parameter and the group size respectively for the unemployed outsiders. The objective of the government is to maximise the votes, V , in order to return to power¹¹. The maximum votes provide the electoral equilibrium that ensures its re-election. The government strategically chooses I to influence V by appropriately influencing a^* and b^* . Thus, in the overall Nash equilibrium (PNE), the government maximises votes, given by (8a), subject to the inflation targets of the interest groups, given by (5b) and (5c). Thus the economic problem of the government is the following:

$$\begin{array}{ll} \text{Maximise} & V = (h_1 + h_2 + h_3) + S_1 N_1 (I - [b^*/N_1]) + S_2 N_2 (a^* - I) \\ \{I\} & + S_3 N_3 I \end{array} \quad (8a)$$

¹⁰In probabilistic voting models S_i is equivalent to the percentage of uncommitted voters in group i voting for the incumbent.

¹¹Politicians do not necessarily maximise votes and seek office. The vote-maximising hypothesis is normally attributed to Downs (1957).

Subject to

$$b^* = (xP^0)/4 + [(x^2(P^0)^2 + 8Ixw)^{1/2}] \quad (5b)$$

$$a^* = w/2 + [P^0/(2I)]b^* \quad (5c)$$

The second order condition requires that

$$t_1/t_2 < (S_2N_2/S_1) \quad (5d)$$

where t_1 is the curvature (absolute value of the second derivative) of function b^* with respect to I and

where t_2 is the curvature (absolute value of the second derivative) of function a^* with respect to I .

3. B. Electoral Equilibrium, Optimal Inflation and Endogenously-driven Voters' Coalition: An Existence Proof

In our model, the incumbent government makes an announcement of inflation rate at date/period 1. Upon this announcement, the industrial lobby and the union get engaged in rent-seeking game. From the Nash equilibrium of this rent-seeking game, inflation targets of these interest groups/lobbies are determined. Upon the determination of the inflationary targets, the incumbent government chooses the actual inflation. Given this inflation and inflationary targets of interest groups, voters from different interest groups start moving their allegiance to political parties, wherefrom a coalition of voters emerges that helps the incumbent government hang to power by maximizing its probability of re-election. An artful incumbent, in our model, can predict the outcome of the rent-seeking game and hence inflationary targets of different interest groups. Given the voters' sensitivity and, hence, predicted movements of voters, the incumbent can weigh up the political costs and benefits of inflation. The incumbent thus announces and chooses the inflation rate that maximizes probability of its re-election by creating the largest coalition of voters. Can such an optimal inflation exist? The rest of this sub-section attempts to establish an optimal inflation in the above sense.

The first order condition to maximize the probability of its re-election (or, votes) is derived from the optimization program (8a), (5b) and (5c) as:

$$b^* = \theta \quad (8b)$$

$$\text{where } \theta = [2kI^2] / [-eS_2N_2 + 2eS_1I] \quad (8c)$$

where e is the elasticity of b^* function and given by

$$e = [db^*/b^*] / [dI/I] \quad (8d)$$

$$\text{and } k = (S_1S_3N_3) - (S_2N_2) + (S_1N_1) \quad (8d')$$

Note that the optimal inflation rate is given by equation (8b). At this optimal inflation, the incumbent maximises its probability/chance of re-election by impinging on the voters' movements into and out of the coalition. Thus the optimal inflation rate creates an electoral equilibrium by suitably influencing voters' movements. Due to the concavity of the objective function, the second order condition is satisfied. The crucial question for us is whether there exists such equilibrium. In order to prove the existence of the optimal inflation we rely on the following results.

Result 1: It is important to note that

$$db^*/dI = [2(b^*)^2 - wY] / [2\{Y - [2/(I)]\}b^*] \quad (8e)$$

For $I=0$, b^* takes two values – one is zero and the other is positive. For explaining the equilibrium we choose $b^* > 0$. Assuming that the industrial lobby has a positive inflation target when the actual inflation rate is zero, we draw the b^* function in Diagram 1 as a downward-sloped function. The sufficient condition for drawing b^* as in Diagram 1, we need

$$(b^*)^2 < (wY)/2 \quad (8f)$$

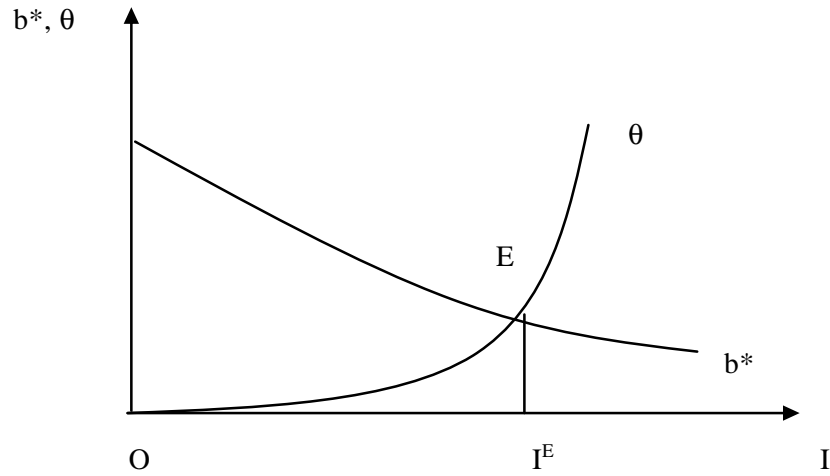
Since the denominator of (8e) is negative in any realistic economy.

Result 2: Differentiating (8c) with respect to I we get

$$d\theta/dI > 0 \text{ if } k < (1/2) \quad (8g)$$

$$\text{That is } (S_1S_3N_3) + (S_1N_1) < S_2N_2 + 1/2 \quad (8h)$$

Inequality (8h) offers the sufficient condition that θ is a monotonically increasing function of I . The θ function is therefore drawn as an upward-sloping function in the diagram. We can ensure the existence of an optimal inflation \bar{I} , given by the above conditions, at which b^* and θ functions intersect:

Diagram 1: Existence of an Optimal Inflation

At E, θ and b^* functions intersect and the corresponding inflation rate I^E is the optimal inflation since I^E satisfies the first order condition. It is also instructive to note that $I=0$ is another possible equilibrium rate of inflation. The second order condition is satisfied if I^E satisfies (5d):

$$t_1/t_2 < (S_2 N_2 / S_1) \quad (5d)$$

3.C. Discussion of the Findings:

There are two possible equilibrium inflation rates: zero inflation and non-zero inflation equilibria. Let us look at the non-zero one first. The solution to equation (8e), I^E , gives the perfect Nash equilibrium inflation for the overall game: the government strategically chooses I^E at Stage I to influence the inflation targets a^* and b^* and, thereby, maximises votes V . I^E thus maximises the probability of re-election of the incumbent government. It is imperative to note that the equilibrium inflation, I^E , depends critically on the political characteristics of the society, that is, N_1 , N_2 , S_1 , S_2 . As the political characteristics undergo changes, the Nash equilibrium inflation also changes. It is interesting to note the plausible comparative static properties of the optimal inflation from the proposed diagram:

Observation 2a: The PNE inflation I^E , ceteris paribus, is counter-cyclical. When the economy is in

recession (boom) the number of employed workers, N_2 goes down (up) and, the θ function shifts down. Therefore the optimal inflation, I^E increases (decreases) in recession (boom). QED.

Observation 3a: For a conservative incumbent government, S_2/S_1 is expected to be larger than S_2/S_1 for a socialist government due to ideological reasons. This is so since it is likely that, *ceteris paribus*, a randomly chosen uncommitted employer/owner of firms is more likely to vote for a conservative government than for a socialist government. On the other hand, a randomly drawn uncommitted employed worker is more likely to vote for a socialist government than for a conservative government. From equation (8f) we know that the θ function shifts up (b^* function remaining unchanged) if (S_2/S_1) declines, which will cause a decrease in the optimal non-zero inflation (I^E).

Observation 3b: Due to the fact that b^* takes two values when $I=0$, there are two equilibrium inflation rates. For the lower value of b^* we can see $b^*=\theta=I=0$. Thus, zero inflation is an optimal monetary policy. The other equilibrium is PNE inflation I^E . If the incumbent chooses the zero-inflation equilibrium, business cycles have no influence on the equilibrium inflationary policy.

Observation 3c: If the incumbent chooses the zero-inflation equilibrium, political factors have no influence upon the equilibrium inflation policy.

Observation 3d: There is indeterminacy in the selection of equilibrium inflation policy. From the well-established literature on multiple equilibria we know either “history”, or “expectations”, choose the optimal inflation rate. Given a history of low inflation rates (and due to consequent expectations), the equilibrium inflation policy of a conservative government will not be different from that of a socialist government. On the other hand, the history of high inflation rates (and consequent expectations) will cause a divergence in the equilibrium inflation rates of a conservative government vis-à-vis that of a socialist government. QED.

If governments choose non-zero inflation then the optimal inflation of a conservative government will be larger than the optimal inflation of a socialist government. This finding contradicts the well-founded result of Alesina (1987) that the optimal inflation of a socialist government is larger than the optimal inflation of a conservative government. On the contrary one can expect the PNE inflation to be higher under a conservative government than under a socialist government. It seems that there is a reason to believe that a conservative government can have an inflationary bias that is larger than that of a socialist government.

On the assumption that the non-zero inflation gets chosen, we will compare the impacts of equilibrium inflation on the economy in Table 1. We find that employed workers will gain at the expense of the unemployed and the employers under an incumbent socialist government. The situation will reverse under a conservative government as the unemployed and the owners of firms/employers gain at the expense of the employed insiders. This is so since the PNE inflation is higher and, hence, the real wage rate is lower under a conservative government. This finding contradicts the general perception of the profession: Alesina (1987) extends the Barro-Gordon model of inflation by introducing different political parties with different preferences over the inflation-unemployment trade-off. The exogenous preferences of the governments are shown to be instrumental in determining inflation. Alesina used a two-party model to show that inflation is always higher under socialists than under conservatives, while unemployment equals its natural rate under both governments. Alesina's argument hinges on the partisan model that assumes that political parties have different preferences for inflation and unemployment. The party that is relatively more averse to unemployment will have incentive to inflate and vice-versa. The traditional literature assumes that the socialist party is more averse to unemployment and, hence, a socialist government will have a strong incentive to inflate.

On the contrary, we find that the conservatives may have an inflationary bias and, thereby, may generate more employment than a socialist government. Our finding turns on the idea that the incumbent can influence inflation targets of voters whilst voters have special characteristics:

sensitivity of voters to a political party is a key factor in determining equilibrium inflation and, consequently, the income shares of different groups of voters. The intuition behind our finding is that the socialist government (relatively) ignores the interests of the employers while the conservative government (relatively) ignores the interests of the workers.

To put it boldly: the traditional partisan models assume that the socialist (conservative) governments are more (less) averse to unemployment, hence socialist (conservative) governments will have stronger (weaker) incentive to inflate in order to create jobs. However, this assumption appears to be weak since inflation - though beneficial for unemployed - has an adverse effect on the employed workers if wages are not completely indexed to inflation. The traditional literature has ignored the conflict of interests between employed and unemployed workers and, instead, assumed that inflation is an unmixed blessing for the working class. In contrast, this paper emphasises that inflation with incomplete indexation can hurt employed workers whilst the unemployed and the employers gain from inflation. It is the exogenously determined sensitivities of voters that will fuel the inflationary bias. If the union representing - the employed workers - has stronger (weaker) influence on the socialist (conservative) incumbent, then inflation will be low (high) with socialist (conservative) incumbents.

Observation 4: There exists a unique Nash equilibrium inflation rate $I^*=0$ if condition (5d) is violated, or if the following inequality holds:

$$(S_1S_3N_3) + (S_1N_1) > S_2N_2 + 1/2 \quad (9a)$$

In this case both the conservative and socialist governments choose zero inflation in equilibrium.

**TABLE 1: MACROECONOMIC EFFECTS OF
EQUILIBRIUM INFLATION**

Macroeconomic Variables and Welfare	Incumbent Conservative Government	Incumbent Socialist Government
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1. PNE inflation	Higher	Lower
2. Real Wage Rate	Lower	Higher
3. Employment/Output	Higher	Lower
4. Welfare of Employed Workers	Lower	Higher
5. Welfare of Unemployed Workers	Higher	Lower
6. Welfare of Employers	Higher	Lower

4. Factional Brawls and Coalitional Stability

Formation of coalition/group and group behaviour offers time-honoured challenges and facile opportunities to economists for a long time. There are two distinct approaches to the formation of coalition, or groups in economics. First, a considerable attention has been accorded to the problem of group formation from the perspective of cooperative games (Aumann, 1989; Aumann and Peleg, 1960; Gillies, 1959; von Neumann and Morgenstern, 1944; Shapley and Shubik, 1969). In these models, potential members decide whether to join a coalition, or group. Once they join and the group is formed, actions of all these members are constrained by the dictate of a mutually agreed contract. The focus is on the collection of joint actions that the group can take independent of the action of non-group members. In order to highlight group formation, these models typically examine the terms of the contract that is mutually acceptable. These models also examine the joint action of the group and also the related issue of limits to group size. More complex models examine the possibility of simultaneous formation of multiple groups. The crux of the analysis is to home in on the formation of a group and the joint action it chooses. The natural extension of this line of

reasoning is to attribute some kind of stability to such groups: the major requirement is to have groups and their joint action to be immune to deviations either by a member, or by a sub-group of members (see Gangopadhyay, 2000; Harsanyi, 1974). On the other hand, the non-cooperative approach highlights the formation of a group in the light of the internal functioning of the group. To put it baldly, in non-cooperative games, the focus of research is on how members *choose* their joint actions (see Gangopadhyay, 2002, Gangopadhyay, 2000; Harsanyi, 1974; Chatterji et. el, 1993). Outcomes of cooperative games, or coalitional games, do not depend on the details of individual actions. In this section of the paper we focus upon the stability of the coalition in the sense of Harsanyi (1974).

In our model a coalitional government is formed by drawing voters/members from three distinct social, or interest, groups. Thus there are three factions in the incumbent government. By factional brawls we mean an aggressive interaction between two, or among three, factions to eliminate the influence of a group upon the inflationary policy. These factional brawls and in-fights can jeopardize the adoption of the optimal inflation. Once a government is formed on the basis of a coalition of voters, these factions have an incentive to exclude the influence of other factions/groups upon the inflationary policy. Once two groups engage in brawls, or conflicts, the third group can join in to tune the policy outcome to its favour. The central question is whether it is possible to have the optimal inflation coalition-proof such that no factions have any incentive to engage in brawls, or conflicts, with other factions to exclude the rival's influence on the inflation policy. In what follows we offer a set of sufficient conditions to establish that the optimal inflation is coalition-proof.

Suppose the union and the industrial lobby are engaged in an aggressive interaction to reduce/eliminate the influence of their rivals on the incumbent government. The unemployed insiders are considered to form a coalition (more correctly, sub-coalition) with the union if the joint intervention/fight leads to the union being more likely to reduce the influence of the industrial lobby. In other word, the sub-coalition of the union and the unemployed outsiders can marginalise the industrial lobby in the incumbent and coalitional government.

In our model we have three powerful players in the coalitional government: the industrial lobby is the first player with N_1 membership, the union is the second player with N_2 membership and the unemployed outsiders are third key player with N_3 as the group-size. The union's inflation tolerance is a^* , the industrial lobby's target of minimum inflation is b^* and we postulate that the unemployed workers seek to have a positive inflation, M . For simplification, we set $M=0$. We do not consider the question of reciprocity here.

To obtain relevant results we need to introduce some definitions:

Definition 1: We define Π_{21} as the probability that the union (second player) can successfully control the industrial lobby (first player), when the industrial lobby and unemployed workers are engaged in a factional brawl. We define H_{21} as the benefit to the union if it controls the industrial lobby in the coalitional government.

Definition 2: H_j is determined in a pair-wise bargaining between two players excluding j . We assume equal bargaining power, hence $H_{12} = (a^* + b^*)/2$, $H_{13} = (b^* + M)/2 = b^*/2$, $H_{23} = (a^* + M)/2 = a^*/2$.

Definition 3: We define L as the "winning effect". L measures a player's increased probability of controlling another player at date $T+1$, given a previous marginalisation of this member at date t .

Definition 4: The cost to player i for forming a coalition with another player is C_i .

The industrial lobby (our first player) has three options when other two players are engaged in a conflict: 1) to form a coalition with the union, 2) to form a coalition with the unemployed, 3) not to form a coalition with either rivals/players. The return to the industrial lobby from forming a coalition with the union is defined as R_{12} :

$$R_{12} = 1/2[\Pi_{13} H_{13} + H_{12}\Pi_{12}(1-L)] - C_1 \quad (10a)$$

= Probability of having a conflict with player 3 $(1/2)$ * Probability of marginalising 3 (Π_{13}) * Benefit from marginalising 3 (H_{13}) + Probability of having a conflict with player 2 $(1/2)$ * Probability of marginalising 2 (Π_{12}) * Benefit from marginalising 2 (H_{12}) * Improvement in marginalising 2 given a successful sub-coalition $(1-L)$ - Cost of forming a sub-coalition. Similarly, we derive the return of player 1 from forming a coalition with player 3 as:

$$R_{13} = 1/2[\Pi_{12} H_{12} + H_{13}\Pi_{13}(1-L)] - C_1 \quad (10a)$$

If player 1 decides not to form a coalition with any of the players, its return is R_1^* :

$$R_1^* = [T_1] + [T_2] \quad (10b)$$

$$T_1 = [\Pi_{23} (\Pi_{12}H_{12} - LH_{12}\Pi_{12})]/2 + [\Pi_{23}\Pi_{12}H_{12}]/2 \quad (10c)$$

$$T_2 = [\Pi_{32} (\Pi_{13}H_{13} - LH_{13}\Pi_{13})]/2 + [\Pi_{23}\Pi_{13}H_{13}]/2 \quad (10c')$$

Simplification of (10b) yields:

$$R_1^* = \gamma_1 H_{12} + \gamma_2 H_{13} \quad (10d)$$

Where
$$\gamma_1 = [\Pi_{23}\Pi_{12} - L\Pi_{23}\Pi_{12}]/2 + [\Pi_{32}\Pi_{12}]/2 \quad (10e)$$

$$\gamma_2 = [\Pi_{32}\Pi_{13} - L\Pi_{32}\Pi_{13}]/2 + [\Pi_{23}\Pi_{13}]/2 \quad (10e')$$

The first term in brackets, T_1 , gives the expected payoff to player 1 (industrial lobby) in a factional conflict with player 2 (union) when player 1 did not form a sub-coalition with player 2 in previous rounds. The second term in brackets, T_2 , gives the expected payoff to player 1 in a factional conflict with player 3 when player 1 did not form a sub-coalition with player 3 in a previous round.

Observation 4a: Player 1 has an incentive to form a sub-coalition with player 2 if

$$R_{12} > R_1^* \quad (10f)$$

Player 1 has an incentive to form a sub-coalition with player 3 if

$$R_{13} > R_1^* \quad (10g)$$

Substituting (10a) and (10d) into (10f) yields:

$$[H_{12}\Pi_{12}(1-L) + H_{13}\Pi_{13}]/2 - [\gamma_1 H_{12} + \gamma_2 H_{13}] > C_1 \quad (11a)$$

Substitution of H_j from Definition 2 yields:

$$\beta_1 b^* + \beta_2 a^* > C_1 \quad (11b)$$

where
$$\beta_1 = [1/4][(1-L)\Pi_{12} + \Pi_{13}]/[\gamma_1 + \gamma_2]/2 \quad (11c)$$

$$\beta_2 = [1/4][(1-L)\Pi_{12}] - [\gamma_1]/2 \quad (11d)$$

In a similar fashion we can show that player 1 has an incentive to form a sub-coalition with player 3

if:
$$\beta_3 b^* + \beta_4 a^* > C_1 \quad (11e)$$

Where
$$\beta_3 = [(1-L)\Pi_{13} + \Pi_{12}] / [4] - [\gamma_1 + \gamma_2] / [2] \quad (11f)$$

$$\beta_4 = [(1-L)\Pi_{12}] / [4] - [\gamma_3 / 2] \quad (11g)$$

Note that γ_3 and γ_4 are defined in an analogous fashion.

The industrial lobby, player 1, has no incentive to form a sub-coalition with any of other players if the following inequality holds:

$$[\beta_1 b^* + \beta_2 a^*] < C_1 < [\beta_3 b^* + \beta_4 a^*] \quad (12a)$$

QED.

Observation 4b: In a similar fashion we can show that there does not exist any incentive for player 2 (union) to form a sub-coalition with either of players if:

$$[\theta_1 b^* + \theta_2 a^*] < C_2 < [\theta_3 b^* + \theta_4 a^*] \quad (12b)$$

Note that θ_i is defined similar to β_i and, hence, calculated in an analogous fashion.

Similarly, player 3 does not have any incentive to form a sub-coalition with either player if:

$$[\sigma_1 b^* + \sigma_2 a^*] < C_2 < [\sigma_3 b^* + \sigma_4 a^*] \quad (12c)$$

where σ_i is defined similar to β_i and calculated in an analogous fashion.

Statement 1: The equilibrium coalition of voters, - as shaped and formed by the optimal inflation rate I^E , which constitutes the political constituency of an incumbent government is coalition proof and, hence, stable if the following inequalities hold:

$$\text{Maximum } \{\beta_1 b^* + \beta_2 a^*, \theta_1 b^* + \theta_2 a^*, \sigma_1 b^* + \sigma_2 a^*\} < \text{Minimum } \{C_1, C_2, C_3\} \quad (12d)$$

$$\text{Maximum } \{C_1, C_2, C_3\} < \text{Minimum } \{\beta_3 b^* + \beta_4 a^*, \theta_3 b^* + \theta_4 a^*, \sigma_3 b^* + \sigma_4 a^*\} \quad (12e)$$

Conditions (12d) and (12e) are sufficient to stave off factional infights and formation of a coalition to block the influence of the other player on the equilibrium inflation policy of the incumbent government.

5. Conclusion

Labour market is a battlefield for political survival of incumbent governments. In order to survive, the incumbent has a temptation to fuel inflation in excess of wage claims. As a result, employment, income and profits will experience a healthy rise that can enhance the probability of re-election of the incumbent government. Yet, inflationary means to achieve political stability may be a treacherous policy since the economy and labour market will pick up along with a decline in the real-wage rates and, hence, at the expense of the employed insiders. The employed will gradually withdraw their support from the incumbent that may bring the house down. The incumbent, hence, faces an uphill task in the labour market due to conflict of interests that may give rise to serious rent-seeking activities that, in turn, will influence the monetary policy and inflation.

The major contribution of this paper is to model this *circular interdependence* of politics and inflation. By assuming an incomplete indexation of nominal wages, we argue that inflation affects the real economy and, thereby, voters' evaluation of the incumbent government whilst such evaluation constrains the incumbent's behaviour which, in turn, affects inflation that further influences voters' evaluation and the real economy. Inflation and politics, thus, have strong mutual feedback: on the one hand, politics through lobbying, interest groups and voting mechanism will have significant impact on the inflationary process. Inflation, on the other hand, will have strong impact on the real economy, interest groups and voters and, thereby, on the polity. This paper develops a simple game to capture this crucial feedback.

It is obvious that the incumbent cannot satisfy all the interest groups at the same time that will cause haemorrhage of votes that will considerably emasculate the incumbent. The fact that inflation affects the real economy and, thereby, voters' behaviour implies that the incumbent can use inflation *strategically*: for political survival the incumbent strategically sets inflation to influence voters' behaviour that will, in turn, engender the electoral equilibrium. The electoral equilibrium

enhances the chances of political survival of the incumbent. The upshot is that the voting mechanism and the visible hand of government can mesh in to engender the equilibrium inflation, which is an outcome of strategic interactions among various interest groups and the incumbent.

The equilibrium inflation is not unique, thus there is indeterminacy in the choice of an optimal inflation policy. We find that there is a zero-inflation equilibrium and also a non-zero-inflation equilibrium. Given the history (or expectations) of low, or zero inflation rates, the zero-inflation equilibrium gets chosen. This equilibrium inflation policy is shown to be unaffected by business cycles and political factors that characterise an economy. On the other hand, if the non-zero-inflation equilibrium gets chosen due to history, or expectations, the non-zero-inflation equilibrium depends critically on the political landscape of the society. We also find that the non-zero-inflation equilibrium is counter-cyclical. We also show that conservative governments -quite contrary to Alesina's finding (1987) - can have a larger inflationary bias vis-à-vis a socialist government, if the non-zero-inflation equilibrium gets chosen. One may thus argue that if there is a history of low inflation (or, low inflationary expectations), the equilibrium inflationary policy of a conservative government is not dissimilar to the equilibrium inflationary policy of a socialist government. The divergence arises only when actual inflation, or inflationary expectation, is high. Contrary to the received doctrine, in such a scenario the conservatives have an incentive to inflate than the socialists in equilibrium. The intuition behind this finding is that the socialist government (relatively) ignores the interests of the employers while the conservative governments (relatively) ignore the interests of the workers. The sensitivities of voters to income shares play a critical role in determining the inflationary bias of the incumbent.

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