Models of Electoral Competition

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1 The downsian approach

Down's pioneering work in 1957 starts what we could call an economic theory of politics: the notion of *homo oeconomicus*, rational acting for her selfish ends, is put into political institutions: politicians "act solely in order to attain the income, prestige, and power which come from being in office. (...) Upon this reasoning rests the fundamental hypothesis of our model: parties formulate policies in order to win elections, rather than win elections in order to formulate policies"[1]. Down's work was able to explain, with a unified theory, political phenomena like party convergence, voter turnout, disinformation on public issues; since these issues were actually puzzling political scientists Downs's work could either be accepted with enthusiasm or hardly criticized but surely it could not be ignored.

The striking feature of the Downsian model is to deal with politics as economists deal with markets and to see the political process as an exchange: consent and policies are exchanged in a specific institutional setting in the same way commodities are exchanged on commodity markets. As for many other models, it was originally formulated without using game-theoretical solution concepts but we can find very useful to translate them in game-theoretic format.

Suppose we have a polity with N citizens and a space $\mathcal{A}$ of feasible public policies with at least three elements; a policy will be defined as an element x of the set $\mathcal{A}$. Citizens have preferences over policies represented by a utility function $V^i(x), i = 1...N$. Thus, the public policy x is relevant for all the members of the community but preferences on it are heterogeneous; the problem is then to perform a collective choice of x. The choice may actually be done in many different ways[2], and different rules for the choice process can be expected to lead to different outcomes. If for example the system is dictatorial then the choice would simply be the policy preferred by the dictator. Here we consider situations in which people can vote for the platform they prefer and the policy implemented will be the one supported by the majority.

[1] Downs, 1957.

[2] As we know from Arrow's theorem that there is no social preordering on the available policies.

Assume then there are two parties L and R each proposing a policy $x \in \mathcal{A}$ that we will indicate with respectively x_L and x_R.

A crucial assumption in the downsian model is that parties can precommit to the announced platforms. Parties are assumed to be voting maximizers: then they have no preferences on the policy space and the policy is just a device to get votes. In this way, once elected, there is no incentive to deviate from the announced platform and this leads citizens to believe that the announced platform will be eventually implemented.

Let us consider two elements of $\mathcal{A}$, x and x': individual i will prefer x to x'' if and only if $V^i(x) > V^i(x')$, and will be indifferent if $V^i(x) = V^i(x')$. Then if x is preferred to x' by the majority of the population in pairwise comparison we say $x \succ x'$. The Marquis de Condorcet noted more than two centuries ago that a simple majority rule does not lead to a defined social choice function since the relation $\succ$ does not need to be transitive. This result goes under the name of Condorcet Paradox and essentially leads to the conclusion that, given any option x, there may exist an option x' which is preferred to x in pairwise comparison. If this is the case then a voting maximizer party could always find a best response $x_L(x_R)$ (or $x_R(x_L)$) to his opponent strategy that leads him to win the elections. Since this is true for both R and L, we end up without an equilibrium (in pure strategies). To require the existence of a Condorcet winner is necessary to rule out this possibility:

Definition 1: $x_i \in \mathcal{A}$ is a **Condorcet Winner** in the set $\mathcal{A}$ if and only if $x \neq x_i$ and $x \in \mathcal{A} \Rightarrow x_i \succ x$.

Then, if we want the downsian model to have any predictive power, we must assume that a Condorcet winner exists. Let's denote it with x_c. Then we have the following.

Proposition 1 (*Downs*): Suppose that a Condorcet winner exists. Then the unique Nash equilibrium in platforms has $x_L^* = x_R^* = x_c$.

In other terms, if there exists a policy which is preferred in pairwise comparison to any other, then no party will propose a different platform, which would imply to be a sure loser in the election. Thus, this model predict policy convergence to the Condorcet winner.

Downs' work considered a two party system, and assumed that moving toward the center, parties could not lose their more extremist supporters. But the convergence result is quite robust to the number of the candidates, as proved in Feddersen, Sened, Wright (1990). Suppose then that it is possible for a new party to enter in the electoral competition at a cost δ and let's indicate the payoff from each vote received as D. Then the following proposition is straightforward:

Proposition 2 (*Feddersen, Sened, Wright*): In a Downsian model with entry, there exists an equilibrium where each party chooses x_c and where the number of parties is given by the largest integer d such that $\frac{ND}{d} - \delta > 0$.

It is important to note that Proposition 2 says that there exists such an equilibrium, but this does not need to be unique as in proposition 1. The reason for this is that when we have more than two candidates, we must take into account the possibility of having a more complex individual behaviour. To discuss this point, we have to introduce the notion of strategic voting. The voting behaviour we have described previously (to choose the option that gives higher utility) can be defined *sincere.* Sophisticated voters could actually not vote for the thing they like the most, but vote a best response to other people actions. Given a set of k proposed platforms $\{x_1, ...x_k\} = X \subset \mathcal{A}$ we will indicate the choice of voter i with a_i and the vector of all votes in the community with $a = (a_1, ..., a_N)$. If agents vote strategically then voting decision of agent i will be derived as

$$a_i^* \in \arg\max_{a_i \in X} \{P(x_1|a_i, a_{-i})V_i(x_1) + ... + P(x_k|a_i, a_{-i})V_i(x_k)\} \tag{1}$$

where $P(x_j|a_i, a_{-i})$ indicates the probability that x_j is implemented when voting strategies are (a_i, a_{-i}). Note that if $X = \{x_R, x_L\}$ then the objective function can be rewritten as

$$\begin{aligned} & \{P(x_R|a_i, a_{-i})V_i(x_R) + (1 - P(x_R|a_i, a_{-i}))V_i(x_L)\} \\ = \quad & \{P(x_R|a_i, a_{-i})(V_i(x_R) - V_i(x_L)) + V_L(x_L)\}\,. \end{aligned} \tag{2}$$

To determine the choice in this case will only be $(V_i(x_R) - V_i(x_L))$. Thus we have proved the following.

Lemma 1 Let a^* be a Nash equilibrium in voting strategies and suppose that voters do not use weakly dominated strategies; then, if there are only two alternatives in X, sincere and strategic voting yields the same winner.

If there are more than two available alternatives then the policy choice is more complex. We will return on this issue when we will have presented an appropriate analytical framework to deal with it.

Two main requirements are then crucial to have the Downsian model working: 1) a Condorcet winner exists; 2) there is competition among parties to reach it. The importance of the Downsian model, even with all its limitations, is to have spelled out most of the important questions for future works. In the rest of this section I will discuss this two crucial assumptions.

The first point requires some further clarification. On this the work of Downs drew on some predecessors. In particular Hotelling (1929) and Black (1948) had proved that if two political parties compete for the votes of citizens who have single peaked preferences along a one-dimensional policy space, then they will converge on the policy preferred by the voter whose position is median in the policy dimension. Stated more precisely, we have the following.

Proposition 3 (*Black*): If all citizens preferences are single peaked on a single dimension, then the median ideal preference is a Condorcet winner and the social preference order under simple majority rule is transitive, with the median standing highest in the order.

This famous result is still one of the most widely exploited in political economy; nevertheless, it is reasonable to ask what is the generality of these conditions. The first consideration is that this framework is quite robust if the policy space has one dimension but is extremely fragile if we want to consider multiple dimensions. In other terms, very strong restrictions on the distribution of preferences are required to guarantee an equilibrium with multiple policy dimensions[3]. Nevertheless, many problems of interest involve such multiplicity. Think for example of a government who can control redistributive taxation and the provision of a public good: the Downsian model has little to say in this simple model. This has led to develop different frameworks for the positive analysis of economic policy making.

As we said, the requirement of political competition relies on the assumption that parties are able to precommit to policies since they don't care about them. A different view would be that political parties, as well as the voters, care about policy outcomes. In this class of models, parties are assumed to be partizan: they care about winning in order to be able to implement their preferred policy. However, these preferences can be translated into policies only in case of victory, which gives anyway an incentive to move toward the median voter. This tension between policy preferences and incentive to win provides new insights in our understanding of electoral competition. Nevertheless, if the median voter preference is known and parties policy preferences are on opposite sides with respect to the median voter, then we can expect perfect convergence to the median voter's preferred policy even with completely partizan parties[4]. The reason for this is that a party can win elections being slightly closer to the median voter than its opponent. Then, for any given platform of the opponent, the policy outcome will be closer to the preferred one when closer than the opponent to the median voter. This eventually leads both parties to target the median voter: the motivation of parties changes but the political implication is the same as in the Downsian model.

The problem here is that the political platform proposed by each party is not time-consistent. As stressed by Alesina (1988), the incentives faced by the party change after the elections: there will be no need to target the median voter and the preferred policy will be implemented. But if voters anticipate this process, then there is no way for a party to make any credible commitment to a policy different from its preferred one. Here, a credibility problem leads to a non-convergence result. One way to overcome this credibility problem is through reputation: if we consider repeated interactions among parties and voters, then we can have a different incentive

[3] Plott, 1967.
[4] Calvert, 1985.

to maintain the campaining promises. For reputation to be effective the discount rate of parties must be sufficiently high, in the sense that parties care enough about the future. Here the trade off is then between acting unconstrained and enjoing immediately all the benefits of victory or instead "spread" these benefits along time. We will reconsider this trade-off when dealing with agency models.

It is now clear that a central issue in this analysis is information: proposed platforms and parties' policy preferences could be unknown or not understood by voters, parties could be uncertain about the policy preferences of the median voter and so on. The role of information in the political arena, as well as in the economy, may be very important in determining the policy outcome.

We will return later on this issue. For now, it is important to summarize briefly the consequence of the Downsian approach on this topic. One important consideration in Downs' work is that in a sizable electorate "the returns from voting are usually so low that even small costs may cause many voters to abstain". This tendency could be expected to be reinforced by parties' convergence. If the probability to be a pivotal voter is very low (i.e. if the electorate is very large) then even small voting costs should induce massive abstention. Even if observed abstention sometimes may be very high[5], nevertheless it is difficult in this way to explain the behaviour of millions of voters. This is the substance of the so called "paradox of voting". Riker-Ordeshook (1968) include in their framework a sense of duty by the citizens: in other terms to show up in the polls may be beneficial independently of the policy outcome. This reduces the problem to a matter of preferences, which is essentially equivalent to an admission to be unable to find a different explanation.

The low probability of being a pivotal voter has consequences not only for political participation but also for the desire to be informed about political issues. The benefit of information about the candidates and their proposed platforms is very low, since the decisions affected are going to be almost irrelevant for individual welfare. Then, if this information is somehow costly, we should expect not only rational abstension but also rational ignorance on political issues. This consideration can be very important for our previous discussion about credibility, and implies a substantial lack of information by citizens about candidates and their proposals. This should give some possibility to parties to hide their true political preferences.

To summarize, the main conclusion of this section is that the existence of a Condorcet winner is necessary to give a predictive power to a Downsian model of politics. Most literature in political economy has chosen to work with models in which the existence of a Condorcet winner is guaranteed. This is the reason fo the success and wide application of this result in models of political economy. The application of the median voter theorem has undoubtedly been helpful in many cases. But we noticed also that a very large class of relevant problems are left out with this choice. In the next sections we will see some alternative models to deal with multidimensional

[5] Some evidence has also been found that in "close" elections (for example when polls are very uncertain, implying an higher probability to be pivotal) the turnout has been higher (Morton, 1991)

issues.

2 Probabilistic voting models

One way to look at the problem of the existence of a Condorcet winner is to look at the discontinuities in the payoff functions of the parties. This discontinuity derives from the fact that small changes in the platform proposed lead a loser to become a winner and vice-versa. Then, if we look not at number of votes but at the payoff from winning (assuming this payoff equal to zero if election is lost) it is clear that the payoff function of each party is discontinuous. This prevents the possibility of finding an equilibrium. Then, exactly as a game may still have equilibria in mixed strategies when it has no equilibrium in pure strategies, we can introduce probability of winning in our electoral game to find an equilibrium. Of course, the reason for considering probabilistic voting models is not only a technical one. Calvert (1986) justifies the use of probabilistic voting models on the ground that assuming that "candidates cannot perfectly predict the response of the electorate to their platforms is appealing for its realism". To use the words of Coughlin (1992), "because of their importance to candidates' decisions, the candidates' beliefs about how their choices relate to the voters' choices provide a natural dividing line for the economic models of elections that have been developed. The first category consists of the election models in which each candidate believes that, once the decisions of both candidates in the race have been made and are known to them, they will be able to predict exactly what all of the (or all of the nonindifferent) voters'decisions will be; and they can do this no matter what strategies the two rivals may happen to choose. These models are called *deterministic voting models* because the candidates' decisions fully determine the choices they expect all (or all of the nonindifferent) voters to make. The second category consists of models in which, even after learning the decisions of both of the candidates in the race, both candidates are still uncertain about the voters' decisions. These election models are called probabilistic voting models (reflecting the fact that the candidates uncertainty requires a probabilistic description of the voters' choice behaviour".

Let's consider again our two parties electoral competition model. The probability of winning for party R is defined as $p^R(x_R, x_L)$. Voting behaviour is going to depend not only on the difference in utility deriving from the two platforms but also on an idiosyncratic random shock ε. Then voter i will vote for party R if

$$V_i(x_R) - V_i(x_L) + \varepsilon_i > 0 \tag{3}$$

where ε_i is distributed according to the density function $f(\varepsilon)$ (with distribution function $F(\varepsilon)$), which is symmetric, has zero expected value and is uncorrelated with $V_i(.)$.

This is a random utility model of the type first studied by McFadden. "The disturbance term ε (...) may have the conventional econometric interpretation of the impact of factors known to the decision-maker but not to the observer. However, it is also possible that a disturbance exists in the decision protocol of the economic agent, yielding stochastic choice behaviour". In probabilistic voting models this "allows for both the possibility that voters vote deterministically but candidates are uncertain about what these choices will be and the possibility that voters' choices are genuinely stochastic in nature"[6].

Now we can say that the probability that agent i votes for party R is

$$\begin{aligned} p_i^R(x_R, x_L) &= \Pr\{V_i(x_R) - V_i(x_L) > -\varepsilon_i\} \\ &= [1 - F(V_i(x_R) - V_i(x_L))] = F(V_i(x_L) - V_i(x_R)) \end{aligned} \tag{4}$$

by the symmetry of $f(\varepsilon)$. Analogously we define $p_i^L(x_R, x_L)$.

From the point of view of the parties, voting behaviour of agent i can be represented as a random variable e_i: we use the convention that $e_i = 1$ if vote i goes to party R and $e_i = 0$ if it goes to L[7]. Then the expected number of votes for R is

$$E(n_R|x_R, x_L) = E(\sum e_j) = \sum E(e_j) = \sum p_j^R(x_R, x_L) \tag{5}$$

Analogously $E(n_L|x_R, x_L) = \sum p_j^L(x_R, x_L)$. The expected (by both parties) plurality for party R is given by

$$E(n_R - n_L|x_R, x_L) = \sum(p_j^R(x_R, x_L) - p_j^L(x_R, x_L)). \tag{6}$$

Then we can say that a pair $\{x_R^*, x_L^*\}$ constitutes a pure strategy Nash equilibrium in the expected plurality game if $E(n_R - n_L|x_R, x_L^*) \leq E(n_R - n_L|x_R^*, x_L^*) \leq E(n_R - n_L|x_R^*, x_L)$ $\forall x_R, x_L \in \mathcal{A}$, where $\mathcal{A}$ is assumed to be a non-empty, compact and convex subset of a euclidean space E^n.

It should be noted that here we cannot apply the Nash theorem (which refers to finite strategic-form games). Here probability enters directly into the payoff function which is then continuous; this means that to have a pure strategy equilibrium we need applicability of the Debreu-Glicksberg-Fan theorem for continuous payoff functions[8]; in particular this theorem requires the payoff functions of each player to be quasi-concave in his own strategy for each given strategy of the opponent. It is then clear that a pure strategy equilibrium does not need to exist for any specification we adopt in a probabilistic voting model. Anyway, the smoothness of the response of political choice to policy changes makes it much easier to find an equilibrium.

Also, the equilibrium does not need to be unique, nor it implies convergence of policies. Specific cases that guarantee unique equilibrium can be found[9] but sufficiently general models do not guarantee this feature. In our context we can say

[6] Coughlin (1992).
[7] See for example Lindbeck-Weibull (1987).
[8] See Fudenberg-Tirole (1991).
[9] See for example Coghlin, chap. 2.

that if $p_i^R(x_R, x_L)$ and $p_i^L(x_R, x_L)$ are strictly concave $(i = 1...N)$ then equilibrium is unique and implies convergence of policies. More in general and with less restrictive assumptions it may be proved that, if we define the set of equilibrium strategies for candidate R as $E_R = \{x_R \in \mathcal{A} | \ \exists x_L$ s.t. (x_R, x_L) is a political (Nash) equilibrium$\}$ (and analogously we define E_L) then $E_R = E_L = E$. This gives us some characterization of equilibria, in the sense that we can be sure that a platform outside E will never be the implemented policy: it is instead impossible to say what political equilibrium is going to occur without further assumptions.

3 Alternative institutional settings

Collective decisions are taken according to established rules. Since we know from Arrow that a definite social preordering does not exist, the rules will inevitably affect the final outcomes. Also, pressures can be expected to change rules when these lead to unsatisfactory outcomes. One possible solution to the Condorcet paradox is then to have an appropriate set of rules that permits to reach decisions even when the policy space has no intrinsic focal point. In this research agenda it is relevant to understand the performances of different rules[10].

The basic idea behind this route to overcome the Condorcet paradox is that if issues are voted not simultaneously then a political equilibrium may be reached also without a Condorcet winner. Let's define the policy choice as a vector $\mathbf{x} = (x_1, ..., x_d) \in \mathcal{A}$. Now let's suppose that, starting from a given status quo, the institutional system allows voters to cast their vote on each issue separately; there are of course many ways in which this can be done; for example it is possible that once a decision has been made in one dimension, no revisions are possible (sequential voting) or that there are different groups called to take decisions on different issues (independent voting), or that any issue can be reconsidered at any time etc. The next result is independent of the specific rule adopted for separating the issues.

Proposition 4 ***(Kramer):*** If preferences in a d-dimensional issue space are separable, if preference sets are convex, then the issue-by-issue majority rule stable point is the issue-by-issue median preference. Reconsiderations of issues do not affect the stability of this point.

Corollary to Proposition 4: Under the conditions of Proposition 4, if a Condorcet winner exists then issue-by issue majority rule voting leads to that point.

[10] Going one step backward, one could also ask how these rules came into existence as a process of choice by rational agents in a constitutional decision stage.The point of view that institutions should be analized from the perspective of the outcomes they yields has been proposed and made popular in particular by Buchanan and Tullock but here we will only be concerned with our more limited problem of finding political equilibria when majority voting is the established rule.

Then, by voting different issues separately we increase the chances of finding a political equilibrium. An equilibrium in an issue-by-issue voting is more likely than in a simultaneous vote in which only a Condorcet winner, if exists, could emerge. It is common to refer to this type of equilibrium as a "structure induced equilibrium", as opposed to "preference induced equilibria" (like the Condorcet winner). This because an equilibrium does not necessarily exist if we remove that particular institutional structure and replace it with another. I think this distinction is actually misleading: also environments with a Condorcet winner are not independent of the institutional setting, in the sense that a Condorcet winner will be selected by majority rule but not necessarily by other decision rules.

It is worth to note that for Proposition 4 to hold we place quite strong restrictions on individuals' preferences. In particular we assume that preferences are separable in the different issues at stake: thus, there is no interaction between issues in each person's evaluations of alternative positions. This assumption is not innocuous and if we remove it then, although a political equilibrium still exists, it will be dependent on the specific procedure adopted (again, if a Condorcet winner exists, then it will be the stable point).This conclusion is of course quite unsatisfactory, since we have a high degree of dependence on procedures. Moreover, without separability, we need to take into account the possibility of strategic voting; Kramer (1972) proves that, if preferences are separable then sincere and strategic voting will yield the same equilibrium in an issue-by-issue voting. If preferences are not separable then we don't have a general existence result: not only the final equilibrium but even its existence may depend on the order in which the issues are considered.

It is then clear that if the problem is solved by fixing the agenda *ex ante*, we are practically giving great decisional power on final outcome to agenda setters. One relevant question is therefore if there is any limitation to the power of agenda setters that could still make this institutional setting a desirable one. Miller (1980) introduces the concept of "uncovered set" to explore the bounds to policy outcomes under different institutional rules.

Definition 2 (*Uncovered Set):* An outcome $x \in \mathcal{A}$ is said to be in the uncovered set if, for any other outcome $x^{'} \in \mathcal{A}$, either x defeats $x^{'}$ or x defeats $x^{''} \in A$, and $x^{''}$ defeats $x^{'}$.

The uncovered set seems to provide a set of possible political outcomes quite robust to changes in the institutional system. If voters are sophisticated enough (i.e. they do not necessarily vote sincerely), then they can manage to choose options inside the uncovered set independently of the agenda, and in a two candidates competition this forces candidates to choose policies inside the uncovered set (Shepsle-Weingast, 1984; McKelvey, 1986). This provides a characterization of the limits to the power of agenda setters. More in general this result provides a characterization of the complex interaction between preferences and institutions: institutions clearly matter but individual rationality can limit the effects of changing environments. As we will see later, it is also true that rationality alone cannot suffice for predicting political outcomes.

4 The citizen-candidates model

In two separate papers Osborne & Slivinsky (1996) and Besley & Coate (1997) propose a new model of electoral competition which explicitly recognize the fact that most policy decisions are undertaken in a context of representative democracy. In their models there is no party as a separate entity with respect to the voters' community. In the words of Besley & Coate "the primitives of the approach are the citizens of a polity, their policy alternatives, and a constitution which specifies the rules of the political process. (...) No pre-existing political actors are assumed, and no restrictions are made on the number or type of policy issues to be decided. Political outcomes are thus derived directly from the underlying tastes and policy technology".

One important feature of this model, which is exactly the opposite of what happens in a Downsian model, is that candidates run for office with their own preferences about policies: this means that they will not be able to precommit to anything else than their preferred policy outcome. The role of the platform announcement in the Downsian model is then replaced by an entry stage in which each citizen may enter the political competition at a given cost.

The model reported here follows Besley & Coate (1997). This model is more general than the Osborne-Slivinsky one, not limiting the policy space to be euclidean and allowing for citizens to vote strategically.

As before we have N citizens labeled $i \in \mathcal{N} = \{1, 2, ...N\}$. The policy choice set does not need to be same for each citizen, so we will have policy spaces defined as $\mathcal{A}_i$ $(i = 1...N)$ with $\mathcal{A} = \cup_{i=1}^{N} \mathcal{A}_i$. This takes into account the possibility that citizens may have different competencies in policy-making. The utility of individual i when policy x is implemented and citizen j is in office is represented by $V_i(x, j)$ where $j \in \mathcal{N} \cup \{0\}$ is the identity of the citizen in office: this captures what Rogoff (1990) defines "ego rent", i.e. the rent deriving from holding office (apart from the policy implemented). In a Downsian model the two advantages of holding office are separated: voters will have $V_i(x)$ while parties will have $V_i(j)$. Here a citizen may enjoy both the advantage to set her own preferred policy as well as the satisfaction to be in office. We indicate with $j = 0$ the possibility that nobody is in office, in which case we also assume that a default policy x_0 is implemented.

The electoral process is divided into three stages: in the first stage citizens decide if entering the political competition at a cost δ. In the second stage every citizen casts a vote for one of the self-declared candidates; it is possible to abstain. The candidate who receive the most votes is elected; in the case of a tie a random draw with equal probability for each of the winning candidates will select the elected one. In the final stage the elected candidate will implement her preferred policy (or the default policy will be implemented if nobody runs for office). To solve the model (and understand why the issue of commitment is crucial), we analyze the three stages by backward induction.

Policy choice: if individual i is elected, the policy implemented will be

$$x_i^* = \arg\max_x \{V_i(x,i)|x \in \mathcal{A}_i\}. \tag{7}$$

It is assumed that the solution to this problem is unique. Thus, the utility vector for society when citizen i is elected will be $(v_{1i}, v_{2i}, ..., v_{Ni})$ where $v_{ji} = V_j(x_i^*, i)$ is the utility of citizen j if citizen i is elected. If nobody is elected then we have the default option implemented with utility vector $(v_{10}, v_{20}, ..., v_{N0})$.

Voting: let's represent the set of candidates with $\mathcal{C} \subset \mathcal{N}$. Citizen's i voting action is represented by $\alpha_i \in \mathcal{C} \cup \{0\}$, where 0 represents abstention. A voting decisions profile will be represented by $\alpha = (\alpha_1, \alpha_2, ..., \alpha_N)$. The set of winning candidates when the set of candidates is $\mathcal{C}$ and the vector of voting decisions is α is given by $W(\mathcal{C}, \alpha)$: it will contain all the candidates who get at least as many votes as any other. Let's denote with $P_i(\mathcal{C}, \alpha)$ the probability that candidate i wins. Then we have

$$\begin{aligned} P_i(\mathcal{C}, \alpha) &= \frac{1}{\#W(\mathcal{C}, \alpha)} \; if \; i \in W(\mathcal{C},\alpha) \\ &= 0 \; otherwise \end{aligned} \tag{8}$$

Citizens voting strategy is a best response to other agents' behaviour. Having a perfect forecast of policy choices (information is complete) citizen j voting strategy will be such that

$$(i)\; \alpha_j^* \in \arg\max \left\{ \sum_{i \in \mathcal{C}} P_i(\mathcal{C},(\alpha_j, \alpha_{-j}^*)) v_{ji} | \alpha_j \in \mathcal{C} \cup \{0\} \right\} \tag{9}$$

$$(ii)\; \nexists\; \widehat{\alpha}_j \in \mathcal{C} \cup \{0\} \text{ s.t.} \sum_{i \in \mathcal{C}} P_i(\mathcal{C},(\widehat{\alpha}_j, \alpha_{-j})) v_{ji} \geq \sum_{i \in \mathcal{C}} P_i(\mathcal{C},(\alpha_j, \alpha_{-j})) v_{ji} \; \forall \alpha_{-j}$$
$$\text{with strict inequality for some } \alpha_{-j} \tag{10}$$

A voting equilibrium is then defined as a vector of voting decisions α^*. *A voting equilibrium (in pure strategies) exists for every non-empty candidate set.*

Entry: Citizen i pure strategy at the entry stage is denoted by $s^i \in \{0, 1\}$, where $s^i = 1$ denotes entry. A pure strategy profile is then $s = \left\{s^1, s^2, ..., s^N\right\}$. The set of candidates is $\mathcal{C}(s) = \{i|s^i = 1\}$ .The anticipated voting profile when candidates set is $\mathcal{C}$ is given by $\alpha(\mathcal{C})$. The expected payoff for citizen i from a pure strategy profile s is given by

$$U_i(s; \alpha(.)) = \sum_{j \in \mathcal{C}(s)} P_j(\mathcal{C}(s), \alpha(\mathcal{C}(s))) v_{ij} + P_0(\mathcal{C}(s)) v_{i0} - \delta s^i \tag{11}$$

We define a mixed strategy in the entry decision for agent j as $\gamma^j \in [0,1]$: then γ^j is the probability for citizen j to become a candidate. A mixed strategy profile is then denoted by $\gamma = (\gamma_1, ..., \gamma_N)$ and the expected payoff for citizen i is denoted by

$$\begin{aligned} u_i(\gamma; \alpha(.)) &= \prod_{j=1}^{N} \gamma_j U_i(1,1,...1;\alpha(.)) + \prod_{j=2}^{N} \gamma_j (1-\gamma_1) U_i(0,1,...1;\alpha(.)) + ... \\ &+ \prod_{j=1}^{N} (1-\gamma_j) U_i(0,0,...0;\alpha(.)) \end{aligned} \tag{12}$$

We define an equilibrium of the entry game given $\alpha(.)$ a profile γ^* such that for each citizen i, γ_i^* is a best response to γ_{-i}^* for given $\alpha(.)$.

Definition 3: $\{\gamma, \alpha(.)\}$ is a political equilibrium if:

(i) γ is an equilibrium of the entry game given $\alpha(.)$;

(ii) for all non-empty candidate sets $\mathcal{C}$, $\alpha(\mathcal{C})$ is a voting equilibrium.

Besley and Coate show that a political equilibrium exists (all the conditions required for the application of Nash theorem are satisfied) and that in many environments it will be in pure strategies (i.e. at the entry stage citizens use pure strategies). Moreover this model will generally have multiple equilibria.

For the existence of pure strategies equilibria two conditions must be satisfied:

1) entry proofness, i.e. nobody who is not in the political race could be better off becoming a candidate;

2) nobody who is candidate would be better off dropping the political competition.

Several different equilibria are possible. To analyze them it is useful to introduce the following definitions:

Definition 4: an **Electorate Partition** is a collection of disjoint, non-empty subsets of $\mathcal{N}$, $(N_j)_{j \in \mathcal{C} \cup \{0\}}$, such that $\cup_{j \in \mathcal{C} \cup \{0\}} N_j = \mathcal{N}$, where N_j is the set of voters of candidate j.

Definition 5: Sincere Partition: given a candidate set $\mathcal{C}$, an electorate partition is said to be sincere if and only if: (i) $k \in N_j \Rightarrow v_{kj} > v_{ki}\ \forall i \in \mathcal{C}$; (ii) $k \in N_0 \Rightarrow v_{kj} = v_{ki}\ \forall i, j \in \mathcal{C}$.

Now we can characterize different situations. The simplest case is when the political equilibrium involves a single citizen running unopposed (one candidate equilibrium).

Proposition 5 A one candidate equilibrium (citizen i runs unopposed) exists if and only if:

(i) the gain from running is at least sufficient to compensate the candidate of the entry cost, i.e. $v_{ii} - v_{i0} \geq \delta$;

(ii) no other citizen has an incentive to be a candidate, i.e. $\forall k \in \mathcal{N}/\{i\}$ s.t. $\#N_k \geq \#N_i$ $\forall (N_i, N_k, N_0)$, then $\frac{1}{2}(v_{kk} - v_{ki}) \leq \delta$ if $\exists$ a sincere partition s.t. $\#N_i = \#N_k$, and $v_{kk} - v_{ki} \leq \delta$ otherwise.

We have seen in a previous section that in a two candidate race voters always vote sincerely: this implies that to have a one candidate equilibrium it must be the case that whoever is sincerely preferred by a majority to the actual candidate stays out of the race because the benefits of entering do not compensate him for the cost. The relevance of the one candidate equilibrium is not much for its predictive power in real world where one candidate elections are rarely observed in democratic systems; it is instead of interest because a one candidate equilibrium is substantially a case of policy convergence and, if the cost of entry is small, then to have a one-candidate equilibrium requires to have a Condorcet winner in the policy space. In this sense the Downsian result can be seen as a special case of the citizen-candidates model.

Corollary to Proposition 5: Suppose that for all $i \in \mathcal{N}$, $\mathcal{A}_i = \mathcal{A}$ and $V_i(x, j) = V_i(x)$ $\forall j \in \mathcal{N}$ and $x \in \mathcal{A}$. Then

(i) if $\delta \to 0$ and a political equilibrium exists in which citizen i runs unopposed, then x_i^* must be a Condorcet winner in the set of alternatives $\left\{x_j^* : j \in \mathcal{N}\right\}$;

(ii) if x_i^* is a strict Condorcet winner in the set of alternatives $\left\{x_j^* : j \in \mathcal{N}\right\}$ and if $x_i^* \neq x_0$, then a political equilibrium exists in which citizen i runs unopposed for $\delta \to 0$.

Thus to have a one candidate equilibrium our model should essentially satisfy the same conditions required for the existence of a Condorcet winner. This means that we have at least the same chances to find a political equilibrium in a citizen-candidate as in a Downsian model.

In general, we can expect to find equilibria in many situations in which the Downsian model does not provide any prediction. An important class of equilibria involves the presence of two candidates. Here the meaning of a two candidate equilibrium is different from the case in which candidates can precommit to any policy: if candidates can credibly commit to any policy then either they converge to the Condorcet winner (if it exists) or they end up chasing each other forever. In a citizen candidate model our two candidates cannot credibly precommit to any policy different from their preferred one, so if such an equilibrium exists, our candidates must be proposing different things and are going to implement different policies if elected.

Proposition 6 Suppose that a political equilibrium exists in which citizens i and j run against each other. Then

(i) $\exists$ a sincere partition (N_i, N_j, N_0) *s.t.* $\#N_i = \#N_j$;

(ii) $\frac{1}{2}(v_{ii} - v_{ij}) \geq \delta$ and $\frac{1}{2}(v_{jj} - v_{ji}) \geq \delta$.

Furthermore, if $N_0 = \{k \in N | v_{ki} = v_{kj}\}$ and $\#N_0 + 1 < \#N_i = \#N_j$, then these conditions are sufficient for a political equilibrium to exist in which i and j run against each other.

Essentially, to engage in a two candidate competition it must be the case that the entrant have some chance of winning; since this must be true of both candidates and since there is no uncertainty, it must be the case that the electorate split equally. The candidates must find convenient to run, in the sense that their expected benefit (one half of the benefit they could get if they were sure winners) must be larger than the cost of running. Moreover, if two candidates are running and less than one third of the population is indifferent between them, then nobody else will enter in the competition. The intuition behind this last result relies on the fact that, if more than one third of the voters abstain, then there could be the possibility for an entrant to capture all of them and winning the election. If abstentions are less than one third it could still be possible for a potential entrant to be preferred but if the competition becomes with three candidates then strategic voting and sincere voting are not equivalent anymore. It could be the case that, *given the behaviour of other voters*, it could be optimal not to vote for the preferred candidate since he is going to lose. When two candidates are already there, a third cannot be sure to enter and capture the votes correspondent to his sincere partition. Given that the solution concept is Nash equilibrium, this action of voters is optimal given the behaviour of other voters and the decision of the potential entrant not to enter is optimal given the fact that it would not be voted. Then it is clear that many equilibria are possible, if sustained by appropriate beliefs about the decisions of other agents. In the words of Besley and Coate "two candidate competition can become a self-fulfilling prophecy, with citizens' beliefs in the inevitability of two candidate competition guaranteeing that the system survives by deterring costly political entry. In many environments (...) there will be many two candidates equilibria who are 'far apart'. Hence, our model does not yield any central tendency for political outcomes. On the other hand, extremism does require a counterweight; if a very right wing individual is running, then a very left wing one must be opposing him".

Finally, we can have equilibria with more than two candidates. The next proposition set the conditions for this to happen.

Proposition 7 Let $\{s, \alpha(.)\}$ be a political equilibrium with $\#\mathcal{C}(s) \geq 3$ and let $\widehat{W}(s) = W(\mathcal{C}(s), \alpha(\mathcal{C}(s)))$ denote the set of winning candidates. If $\#\widehat{W}(s) \geq 2$ there must exist a sincere partition $(N_i)_{i \in \widehat{W}(s) \cup \{0\}}$ for the candidate set $\widehat{W}(s)$ s.t.

(i)$\#N_i = \#N_j \ \forall i, j \in \widehat{W}(s)$, and
(ii)$\forall i \in \widehat{W}(s) \ \sum\limits_{j \in \widehat{W}(s)} (\frac{1}{\#\widehat{W}(s)}) v_{kj} \geq Max \left\{ v_{kj} | j \in \widehat{W}(s) / \{i\} \right\} \forall k \in N_{i.}$

Moreover, $\forall j \in \mathcal{C}(s)/\widehat{W}(s)$ we have

(iii) $\mathrm{W}(\mathcal{C}(s)/\{j\}, \alpha(\mathcal{C}(s)/\{j\})) \neq \widehat{W}(s)$, and
(iv) $\exists k \in \mathcal{C}(s)$ s.t. $\sum_{i \in \widehat{W}(s)} (\frac{1}{\#\widehat{W}(s)}) v_{ji} - \delta > v_{jk.}$

First, notice that if two or more candidates get the same votes, then each voter is pivotal: thus, each voter is either voting for a candidate in the set of the winners (his preferred among the winning ones) or is indifferent among all the winning candidates. Then there must exist a sincere partition for the set of winning candidates such that condition (i) is satisfied. Condition (ii) says that each voter must be preferring a lottery among all the candidates in the winning set to the certain victory of his next more preferred candidate in the winning set. Condition (iii) says that for a losing candidate to enter the competition he must be affecting the outcome (the set of winning candidates), while condition (iv) tells us that a losing candidate prefers a lottery over the winning set when he is in the competition over a lottery over the winning set when he drops out. "These equilibria makes sense of the commonly held notion that candidates sometimes run as 'spoilers', preventing another candidate from winning".

As it is now clear, the citizen-candidate model not only provides political equilibria without a Condorcet winner: somehow it gives "too many" equilibria. This is because it gives only a minimal institutional structure to the electoral process, unveiling the possibility of many potential equilibria in politics, where people's beliefs and further institutional constraints are then essential to understand where the electoral process leads in terms of policies. "For those who would like a clean empirical prediction, our multiple equilibria will raise a sense of dissatisfaction. However, this findings squares with the more familiar problem of game theoretic models: that rationality alone does not typically pin down equilibrium with complete precision (...). This suggests the need to understand better the role of political institutions as coordinating devices, giving some greater determinacy to equilibrium outcomes".

5 Agency models

So far we have considered, in various ways, environments with many voters, and we have seen that a very important issue is that these models are not always able to deliver predictions, i.e. political equilibria may not exist or may be too many.

An alternative approach depicts the relationship between voters and politicians as a agency model, the principal being a representative voter and the agent an incumbent who tries to be re-elected. It should be immediately clear, then, that in this model there is no precommittment to policies. The incumbent delivers the policies preferred by the citizen to be re-elected in office, not because he had promised those policies in the previous electoral campaign. Another crucial ingredient, as in all principal-agent models, is imperfect information: the politician is able to deliver something good for the citizen but the monitoring is imperfect. We can have either moral hazard (the incumbent has a cost of providing good policies) or adverse selection (the incumbent could be good or bad but he wants to be re-elected anyway) or both.

Since Barro (1970), these models have mainly been used to study the incentives faced by incumbents to provide the policies preferred by citizens; this is natural since an agency relation is particularly concerned with some notion of performance. Banks and Sundaram (1999) develop a general approach to the problem when there are both adverse selection and moral hazard. Their model is not specific to a political situation but is very well suited for this type of analysis. Applications of agency models to politics include distortions in policy choice (Harrington, 1993) political business cycle (Rogoff, 1994), yardstick competition in tax setting (Besley-Case, 1995), the form of transfers to special interests groups (Coate-Morris, 1995). Apart from Harrington (which allows for heterogeneity in priors about effectiveness of policies), all these models consider a representative voter. This assumption seems to be appropriate to study some concept of performance (with no distributive conflict) and less suited to study redistributive policies; nevertheless, this apparent limitation is also due to the specific way an agency relationship has been conceived in the political arena.

In the following I will mainly rely on the model of Banks and Sundaram (1999), the only difference being that, for simplicity of exposition, I will only consider a two periods model.

Let's consider a group of potential politicians $i \in I$. Each politician may be classified according to a relevant characteristic or "type". The set of possible types is represented by $\Omega = \{\omega_1, ..., \omega_n\}$. We also represent the set of all probability distributions on Ω as $P(\Omega)$. Agents are i.i.d. draws from a common distribution $\pi \in P(\Omega)$: this ensures they are a priori identical. Politicians are able to generate "rewards" r for the citizens when in office: these are in general things about which the citizens care, so we can identify them with "good policies" (again assuming there is a common objective function for every member of this society and no conflict). We assume $r \in \Re$. The distribution of rewards in a given period depends on the action (policy) a the agent takes in that period and is denoted $F(.|a)$. The action space $\mathcal{A}$ is assumed to be a compact non-degenerate interval $[\underline{a}, \overline{a}]$. Actions are not observable by the principal and the agent's true type is private information to the agent: thus we have both moral hazard and adverse selection.

The payoff function of an agent of type ω is $v(a, \omega)$ when the agent-politician is in office and 0 when he is unemployed. v is assumed to be strictly concave and differentiable on $\mathcal{A}$ for each ω. Also, it is assumed that for each $\omega \in \Omega$ there exists an action $a(\omega)$ satisfying $v(a(\omega), \omega) > 0$. A discount factor for future payoffs δ is common to all agents. Principal's utility is simply a strictly increasing and continuous function $g(r)$, with a discount factor β.

A strategy for the agent is a function $\gamma : \Omega \to \mathcal{A}$. Each type will have a different cost in providing the action, then a strategy for the agent will consist in a mapping from her type to the action space. A strategy for the citizen is $\sigma : \Re \to [0, 1]$. In other terms, given the prior information available to the citizen about the agent's type and observing the reward he gets, he must decide if re-electing the incumbent or not; allowing for the use of mixed strategies, $[0,1]$ is the probability to confirm an incumbent in office.

Thus, the voters only observe rewards, which are a noisy signal of the incumbent's type and action; when reward is observed, the principal updates her beliefs on the incumbent's type using Bayes rule. The probability of having an agent of type k currently in office when a reward r is observed is:

$$p_k(r) = \frac{\pi_k f(r|\gamma_k)}{\sum_{m=1}^{n} \pi_m f(r|\gamma_m)} \tag{13}$$

where π_k is the prior probability that the incumbent is of type k. Note that γ_k is a conjecture about the strategy used by agent k, since the true action is unobservable.

The timing of this two-periods model is the following:

0) nature selects an incumbent ω^1 according to the distribution function π which is common knowledge;

1i) an action $a^1 \in \mathcal{A}$ is chosen by the incumbent;

1ii) r^1 is realized;

1iii) ω^2 is selected in an election in which the incumbent faces an opponent randomly drawn from the same distribution π;

2i) an action $a^2 \in \mathcal{A}$ is chosen by the incumbent;

2ii) r^2 is realized.

Solving the game backward we have that in the second period the incumbent is acting unconstrained by the perspective of re-election, then he will simply choose $\gamma_k^2 \in \arg\max_{a \in \mathcal{A}} \{v(a, \omega_k)\}$. Now let's indicate with $R(\sigma)$ the sets of rewards for which the agent is retained by the principal (this of course depends on the strategy adopted by the principal); then $R(\sigma) = \{r|\sigma(r) = 1\}$. We have not yet characterized this set, which emerges from the equilibrium of this game. Let's focus instead on the problem of the incumbent in the first period. A first period strategy γ_k^1 of a generic incumbent of type ω_k is said to be optimal against σ if

$$\gamma_k^1 \in \arg\max_{a \in \mathcal{A}} \left\{v(a, \omega_k) + \delta \Pr\{r \in R(\sigma)|a\} \, v(\gamma_k^2, \omega_k)\right\}.$$

Then a strategy of the incumbent is defined as $\gamma = \{\gamma_1, \gamma_2\}$. We will say that a strategy σ^* of the citizen is optimal against γ if

$$g(r_1(\gamma, \sigma^*)) + \alpha g(r_2(\gamma, \sigma^*)) \geq g(r_1(\gamma, \sigma)) + \alpha g(r_2(\gamma, \sigma)) \;\forall \sigma \in [0,1].$$

Finally, we say that a pair (σ, γ) constitutes an equilibrium for this model if σ and γ are optimal against each other.

To find a solution to this problem Banks and Sundaram add to this problem a number of technical assumptions about the distribution function of rewards; also, one assumption is necessary about the agents' utility function: for each a, $v(a, \omega_1) <$

$v(a, \omega_2)... < v(a, \omega_n)$ and $\frac{\partial v(a,\omega_k)}{\partial a}$ is strictly increasing in k. Then they show that an equilibrium of this game exists. The equilibrium will be characterized by the agent's action being monotone in his type in each period and the principal following a cut-off strategy, i.e. $\sigma(r) = 1 \; \forall r \geq r^*$. Moreover, agent's action in the first period is no smaller than the action in the second period.

Thus, one conclusion of this model is that, even without precommittment to policies, the perspective of being re-elected affects the performance of an incumbent: all agents will deliver better policies in the first period than they would have otherwise (like in the second period). This is what Banks and Sundaram call the "performance effect". There is also a "selection effect", in the sense that not all agents will be equally likely to be re-elected for the second period: better types will have generally more chances to be confirmed. Thus, the perspective of re-election for the incumbent gives a double advantage to citizens: it both delivers more effort by the incumbent in office (independently of his type) and more probability to have a better type in service in the second period.

These findings have been tested empirically in Besley & Case(1995); they use data on gubernatioral administrations in the U.S. exploiting the fact that there is a limit in the possibility to be re-elected. This means there are governors who have a chance to be re-elected and governors who are in their last term, then not having a chance to stand again in elections. "Finding that term limits matter would make us more sanguine about the relevance of such models for understanding the real world". Besley and Case show that taxes and expenditures are higher during the last term in office, whatever the party affiliation of the incumbent: this also generates a kind of fiscal cycle induced by term limits. For the authors this amounts to a good evidence of the fact that "gubernatorial term limits have a significant effect on economic policy choices".

The fact that redistribution is not taken into account is anyway a serious limit of this model. After all, most policies involve some kind of redistribution, at least in relative terms (i.e. who actually enjoys more benefits from a good performance?). Low taxes and expenditures, for example, are not necessarily a good thing for the overall population. As we said, so far this class of models seems to have been of little help for analyzing redistributive policies; since most of the literature on imperfect information has been developed in the principal-agent framework, there has been little consideration of the role of information in political economy models of income redistribution.

6 Some normative issues

The public choice literature has often used the term "political failure" to indicate inefficiencies generated by governmental activity. A normative analysis of political outcomes consists of weighting this kind of failures against market failures to determine if public intervention may improve or not with respect to market outcomes.

However, the definition of what a political failure is and when it occurs is not uncontroversial. A first possibility, suggested by Wicksell, is to justify public intervention only if it is unanimously supported. This is substantially equivalent to endorse a strict version of the Pareto principle as the sole admissible criterion, since intervention would be unanimously supported only if it leads to Pareto improvements. Along these lines is the work of Buchanan[11], who starts from considering situations without public intervention as a benchmark. If we indicate with x_0 the outcome of such a situation, then we will have a political failure according to Buchanan if the outcome selected by the political process does not Pareto dominate $x_{0.}$ The scope of the government according to this vision should not include redistributive policies if they do not derive from unanimous consent.

An alternative possibility is to consider a political failure the choice of options that are not efficient, i.e. that are inside the relevant Pareto frontier. The difference with the previous possibility is that it does not start from a no-intervention status quo, but only considers possible shifts in the Pareto frontier. This is the approach considered in Besley & Coate (1998), who parallel the analysis of market failures: "this is a potentially important departure between political economy analysis and traditional normative analysis since a benevolent planner would always choose policies from the economy's Pareto frontier". In particular, Besley and Coate argue that second best Pareto efficiency of policies is the most appropriate benchmark for assessing the performance of policy-making. It should be noted, however, that the political process can be included among the transaction costs that prevent applicability of the Coase theorem, where with the term transaction cost we indicate "anything that impedes the specification, monitoring, or enforcement of an economic transaction"[12].Therefore, we should consider that "the transaction technology and the limitations it imposes on economic possibilities are just as real as the production technology and its limitations. (...) Our test of whether an outcome is inefficient needs to recognize the constraints imposed by transaction costs just as much as we respect resource and technology constraints"[13]. Thus, "an outcome for which no feasible superior alternative can be described and implemented with net gains is presumed to be efficient"[14].

It is then clear that what can be evaluated is not much the policy choice in itself but the institutional system that leads to certain choices. If a policy outcome is inside the second best Pareto frontier, the relevant question is if it would be possible to improve upon this situation using a different system for public decision making. The research programme that aims to compare different institutional settings has been defined "constitutional political economy", since institutional choices are usually possible only at a constitutional stage. Persson-Tabellini (1998), compare the

[11]For example, Buchanan (1967).
[12]Dixit (1996).
[13]Dixit (1996).
[14]Williamson (1996).

implications on public spending of different systems (majoritarian versus proportional and presidential versus parliamentary) systems. But it is hard to derive from their analysis any normative prescription, as we cannot easily say if more or less public expenditure leads the economy towards more efficient situations.

Coming to the models presented in this paper, the first important (though probably obvious) result is the following:

Proposition 8: Let x_c be a strict Condorcet winner in $\mathcal{A}$, then it is Pareto efficient in $\mathcal{A}$.

It is indeed obvious that the set of Condorcet winners must be a sub-set of Pareto efficient policies, since if a policy is preferred by everyone then it is also preferred by a majority of the population. This clearly implies that we cannot have political failure (in the sense specified above) in a Downsian model. To understand this point it is important to distinguish between the limitations imposed by the availability of instruments and the limitations imposed by the political process. It is possible, for example, to claim that the median voter's choice of public good provision is inefficient because it does not satisfy the Samuelson rule. But it should be noted that the Samuelson rule refers to cases where first best instruments are available. In contrast, the existence of a Condorcet winner in this context is possible only if tax instruments are limited to second best options. Therefore, it would never be possible for our median voter to pick up the Samuelson solution, but this is an assumption, not a result.

Same conclusions apply for the citizen-candidates model: since the policy implemented is optimal for one of the agents then it is impossible to improve the condition of any member of the polity without reducing the payoff of none of them: "there is sometimes a concern that the utility of the policy maker is allowed to count in the assessment of efficiency. If it did not, then it is clear that there is no presumption that this simple form of efficiency would hold. However, this seems to us to be a peculiar judgement and, essentially, a distributional judgement rather than an assessment of efficiency"[15]. However, inefficiencies are possible if voters care about the identity of the policy-maker. Besley-Coate (1997) show that if citizens differ in competence, then there is no guarantee that the best one is chosen, since he could have non-majoritarian policy-preferences. This is avoided if the citizens space is "rich" enough, in the sense that for any policy preferences it is possible to find citizens with any level of competence. Besley-Coate (1998) show how the identity may also be important for the private decisions it induces, in the sense that some politicians will be better than others in coordinating the economy to outcomes with higher private investments. In dynamic settings there are many more possible sources of inefficiency deriving from collective decision making (we do not analyse them here).

It should be noted that nothing can be said from a distributional point of view: in other terms, there is no guarantee that any situation that is judged desirable according

[15] Besley-Coate (1998).

to some criterion will be reached as the outcome of collective decision-making. Further research is necessary to understand the relation between political outcomes and the judgements expressed on the basis of alternative social welfare functions. One optimistic conclusion in this direction derives from the use of probabilistic voting models. It is possible to show that an electoral equilibrium derived in a probabilistic voting model delivers an outcome that is the same derived under the maximization of a Benthamite social welfare function. Although each candidate is simply trying to maximize her own expected plurality, she ends up acting as if she was maximizing an implicit Benthamite social objective function. Remember that the motivation of politicians in probabilistic models is essentially the same as in the Downsian model. Therefore, uncertainty about voters decisions makes it optimal for parties not to appeal only to the median voter but to give a positive weight in their objective function also to other citizens: therefore they maximize a weighted sum of individual's utilities, which essentially constitutes some social welfare function. The implications of this conclusion are of course quite relevant, since it basically implies a rather optimistic view of political processes, even from a distributive point of view. Coughlin presents extensively the reasons for this results and concludes: "I emphasize that I am not concluding that the state is a separate entity that intentionally maximizes an objective function. The important distinction between this position and my conclusion that the collective choices are as if the state is a single decision maker is emphasized by the following observations. First, I have assumed throughout that each of the competing candidates simply wants to maximize her expected plurality. As a consequence, there is no conscious sense on the part of the political candidates that a social welfare maximum will emerge from the political process. Nonetheless, the strategies that the candidates choose turn out to be strategies that implicitly maximize a social welfare function. The upshot of these observations is that the book's welfare maximization result do not support the position that Buchanan's manifesto should be accepted as a basic tenet of public choice theory".

Hence, when thinking about normative evaluation of political outcomes, one should keep in mind that not only different institutional systems deliver different outcomes, but also different representations of behaviour and environments lead to substantially different normative conclusions. Once again it should not be overlooked the strict interaction between normative judgements and positive models, which makes highly interrelated the two types of analysis.

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