Norman Schofield · Gonzalo Caballero · Daniel Kselman *Editors*

Advances in Political Economy

Institutions, Modelling and Empirical Analysis

This book presents latest research in the field of Political Economy, dealing with the integration of economics and politics and the way institutions affect social decisions. The focus is on innovative topics such as an institutional analysis based on case studies; the influence of activists on political decisions; new techniques for analyzing elections, involving game theory and empirical methods.

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devote to clientelism as opposed to the promotion of their programmatic position, and (3) the set of voters who are targeted to receive clientelistic benefits. Section 3 presents the model's actors, their utility functions, and the actions which comprise their choice sets. Section 4 then demonstrates that, absent stronger restrictions on candidate behavior, there will never exist Nash Equilibria with positive clientelistic effort: given some clientelistic proposal by their opponent, candidates can always propose a slightly 'narrower' set of recipients and win an electoral plurality.

This is not to say that the game in its most general form is always characterized by instability. On the contrary, if voter responsiveness to clientelistic resources is sufficiently low, then the game's Nash Equilibrium will be for all candidates to choose the median voter's ideal point, and to devote 100 % of their campaign effort to promoting this platform. Thus, the game in its most general form yields either traditional median voter convergence or theoretical instability. Section 5 relates this general result to past literature on instability in coalition formation processes. It also discusses a set of necessary conditions for the emergence of Nash Equilibria with positive levels of clientelism. One condition is that parties have differential abilities to target distinct subsets of voters. A second condition is that political parties face a *binding turnout constraint*. When turnout is not a given and parties have differential abilities to target distinct subsets of voters, the need to balance one's interest in courting the electoral median with that in maintaining the support of one's ideological base leads, at times, to the adoption of positive equilibrium levels of clientelism.

2 Theories of Clientelism

So as to highlight this paper's specific contributions, here I briefly outline recent theoretical research on the causes of clientelism. In the Introduction to their edited volume, Kitschelt and Wilkinson (2007) present an argument to explain the mix of clientelistic and programmatic appeals in politicians' vote production functions. Driving this mix is the interaction between economic development and electoral competitiveness.[2] At low levels of economic development politics is heavily clientelistic, and increasingly so as competitiveness increases. At high levels of economic development, politics is heavily programmatic and increasingly so as competitiveness increases. Finally, it is at intermediate levels of development that politicians invest more equitably in both forms of linkage. To complement these basic comparative statics, the authors also highlight the role of a publicly controlled political-economy and formal political institutions in conditioning the mix of linkage strategies.

[2]Competitiveness is a notably tricky concept to precisely define and operationalize. Different authors have assigned the concept different empirical referents. Kitschelt and Wilkinson (2007) define competitive elections as those in which "…elections are close between rival blocs of parties… and there is a market of uncommitted voters sufficiently large to tip the balance in favor of one or another bloc." (p. 28)

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In the same volume Magaloni et al. (2007) develop a decision-theoretic model to consider an incumbent politician's decision to generate public as opposed to clientelistic goods. Public goods offer the ability to target a large number of voters, but are risky insofar as voters' response to public good proposals is uncertain. On the other hand, clientelistic goods allow politicians to gain smaller blocs of voter support with certainty. The optimal allocation of clientelistic effort thus increases in: (a) voters' relative preferences for small-scale targeted policy goods (for which economic development should be a reasonable proxy); (b) the relative uncertainty of vote returns to public good provision; and (c) politicians' risk aversion.

These papers emphasize the role of economic development, electoral competitiveness, and incumbents' risk profile in conditioning politicians' optimal mix of clientelistic and programmatic electoral appeals. They do not, however, investigate the relationship between clientelistic appeals and the relative extremism or moderation of political parties' programmatic stances; nor the processes by which candidates choose which segments of the electorate to target with clientelistic goods. Finally, they do not embed the linkage decision in a strategic context such that parties' electoral strategies are an explicit function of their competitors' decisions.

Stokes (2005) analyzes an infinitely-repeated prisoner's dilemma played between an incumbent politician and a potential supporter, where the incumbent decides between providing a benefit 'B' and the potential supporter decides to vote for the incumbent or a challenger candidate. In equilibrium, clientelistic relationships of vote targeting are more likely to arise when: (a) the benefit B is large; (b) voters are 'moderate' supporters of the incumbent, i.e. not heavily biased for or against the incumbent's programmatic policy stances; and (c) when the ideological distance between the incumbent party and her competitor shrinks. Nichter (2008) analyzes a similar model with one major distinction: the game is played between an incumbent politician and a potential voter whose basic decision is not who to choose but whether or not to turnout. Rather than targeting 'moderate' supporters, politicians who use clientelism to increase turnout are more likely to do so among 'strong' ideological supporters. As well, the likelihood of clientelism effectively inducing turnout is no longer a function of the ideological distance separating incumbent and challenger candidates.

This first set of game theoretic papers has made valuable contributions to research on the nature of parties' clientelistic constituencies, i.e. the particular voters or subsets of voters to which parties' devote their clientelistic efforts. However, it does not address the question asked by Kitschelt and Wilkinson (2007) and Magaloni et al. (2007), namely "What is politicians' optimal mix between clientelistic and programmatic campaign strategies?" Furthermore, it does not address the relationship between a party's linkage strategies and the relative extremism of its programmatic stances. Indeed, models by Stokes (2005) and Nichter (2008) stipulate political parties' spatial positions as exogenously fixed, and from these fixed positions identify the subsets of 'moderate' and 'strong' party supporters. In model derived below the choice of programmatic stances is explicit, such that the identity of 'moderate' and 'strong' party ideological supporters arises as an endogenous outcome of strategic competition.

Keefer and Vlaicu (2008) adapt a particular political-economic model (Persson and Tabellini 2000) to the comparative study of fiscal policy under alternative credibility environments. Politicians in their model choose: (a) a level of public good provision; (b) a level of targeted good provision; (c) the set of districts to which targeted goods will be allocated; and (d) rent extraction levels. Not unlike Stokes (2005), the authors find that clientelism will be targeted to electoral districts with low levels of ideological bias, i.e. those districts in which voters are more effectively swayed by targeted policy appeals. They also find that a 'broader' segment of the electorate will be targeted as parties devote more overall effort to clientelistic appeals, i.e. targeting becomes more 'inclusive' as clientelistic effort increases. Finally, they argue that such appeals will be more prevalent in systems where national-level politicians lack credibility on matters of economic governance; and that they will tend to open the door to rent-seeking by public officials.[3] Keefer and Vlaicu (2008) come closest to addressing the set of questions tackled in the proceeding sections. That said, as with the above reviewed research, parties in their model do not choose explicit programmatic positions, which in turn implies an exogenous stipulation of electoral districts which are 'more' or 'less' ideologically biased. In the model developed below clientelistic coalitions' relative 'inclusiveness' and parties' programmatic choices emerge simultaneously in equilibrium.

3 Actors and Utility Functions

The game contains two types of actors: candidates and voters. Label candidates with the marker P and assume throughout that only two candidates compete, such that $P \in \{1, 2\}$. Candidates' decision processes are interdependent, i.e. candidate 1's optimal action is contingent on candidate 2's campaign strategy and vice versa. In contrast voters are non-strategic: they simply choose the candidate whose campaign platform they find most attractive. In the spatial model, campaign platforms consist of what I will label *programmatic* policy proposals. Consider a simple unidimensional policy continuum $x \in [0, 1]$ such that the policy $x = 0$ is the most 'left' policy available to candidates and the policy $x = 1$ is the political spectrum's most 'right' policy option. Candidates' action-set in spatial models consists of a platform choice x_P somewhere in the continuum $x \in [0, 1]$. Having chosen campaign platforms, voters then choose based on their evaluation of candidates' policy proposals.

To embed clientelistic linkage strategies in the traditional spatial model, assume that both candidates must divide *expendable political effort* between promoting and implementing their proposals on issues of national-level public policy, and providing targeted goods to individuals and small social groups. More particularly assume

[3] However they also note that it is not patron-client ties themselves that generate less than ideal fiscal policy, but rather national officials' lack of credibility. Indeed, in a world without such credibility the presence of local patrons actually *improves* voter welfare as compared to one without such local intermediaries.

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that both candidates have a *single unit* of campaign effort which they must divide between promoting their programmatic stances (labeled G_P) and providing clientelistic benefits (labeled C_P). This implies the effort constraint $G_P + C_P = 1$. They must thus choose not only a spatial position x_P, but also the effort levels G_P and C_P which they will devote to two distinct modes of vote-seeking. As we will see below, to the extent that candidates engage in clientelistic campaign strategies voters will discount their national-level policy proposals, and vice versa.

An additional question which candidates must answer in devising a comprehensive campaign strategy is "To whom shall I target my clientelistic effort?" In other words, beyond choosing the overall level of effort to be expended on clientelism C_P, candidates must also choose the subset of voters who will benefit from C_P. This subset may, at least in the abstract, range anywhere from the entire electorate all the way down to a single voter.[4] To make this more concrete, consider our model of the electorate. Voters are defined first and foremost by their *ideal point*, i.e. their most-preferred policy on the continuum $x \in [0, 1]$. Define x_i as voter i's ideal point such that, roughly speaking, a voter i with ideal point $x_i < .5$ ($x_i > .5$) most prefers a policy on the political 'left' ('right'). For simplicity, assume throughout that ideal points are distributed uniformly in the policy space $x \in [0, 1]$ (i.e. $x_i \sim$ uniform$[0, 1]$), such that both the *mean* and *median* of the voter preference distribution are located at $x_m = .5$.

Electoral candidates must choose from this distribution of voters those which they will target with clientelistic inducements. For example, a candidate might target all voters on the political 'left', i.e. whose most-preferred policy is $x_i < .5$; or only the most 'leftist' quartile of voters in the range $x_i \in [0, 1/4]$; or all voters from the political center in the range $x_i \in [1/4, 3/4]$; and so on. Define $\underline{x}_P$ ($\overline{x}_P$) as the most left-leaning (right-leaning) voter targeted by candidate P. We make the following assumptions as to the nature of clientelistic vote-seeking:

Assumption 1 The target set Θ_P must be *continuous* in $x \in [0, 1]$.

Assumption 2 Clientelistic effort C_P is *evenly distributed* among all members of the target set Θ_P.

The first assumption prohibits candidates from choosing a target set with 'breaks' in the distribution of voter preferences. For example, it precludes a strategy in which P targets *both* ideologues on the right in the range $x_i \in [3/4, 1]$ and those on the left in the range $x_i \in [0, 1/4]$. Similarly it precludes a strategy in which P targets ideologues on the right from the range $x_i \in [3/4, 1]$ and 'moderates' on the left in the range $x_i \in [1/4, 1/2]$. On the other hand, it does not prevent P from choosing a target set which contains both 'left' and 'right' voters, so long as these voters come

[4] These extremes, however, are unlikely to be observed in the empirical world, where politicians tend to target more than a single citizen but less than the entire citizenry with clientelistic inducements.

from a continuous range of the preference distribution $x \in [0, 1]$ (as when the target set includes all 'moderates' in the range $x_i \in [1/4, 3/4]$). The second assumption precludes candidates from providing more clientelistic goods to certain members of their target set than to others. All voter types who find themselves contained within a candidate's target set are assumed to receive an equal amount of the benefits resulting from C_P.[5] Define the set of voters targeted by P as the this party's *target set*, denoted $\Theta_P \in [\underline{x}_P, \overline{x}_P]$.

Let $\mathbf{v}_P = \{x_P, G_P, \underline{x}_P, \overline{x}_P\}$ represent a *strategy* for candidate P. Candidates thus choose a platform x_P, a level of effort G_P devoted to promoting this platform, and the endpoints of the target set to which the remaining $C_P = 1 - G_P$ will be targeted clientelistically. Compared to the traditional spatial approach, this model substantially expands the set of campaign strategies available to electoral candidates. On the other hand, I adopt the Downsian assumption that candidates are exclusively *office-seeking*, i.e. their only goal in devising campaigns is political incumbency, implying the following utility function: $U_P = \pi_P \cdot \beta$. The marker π_P represents P's probability of winning the election, and will emerge endogenously as a function of both candidates' campaign strategies (by construction $\pi_1 = 1 - \pi_2$). The marker $\beta > 0$ represents the value candidates attach to winning office.[6]

Just as candidates may employ both forms of electoral linkage, voters too have preferences over both programmatic policy issues and targeted material, professional, or personal inducements. Begin with the natural assumption that holding all else constant a voter with ideal point x_i would prefer that P choose a policy $x_P = x_i$ rather than a policy further removed from her ideal point. We will also assume that voters discount candidates' programmatic policy stances to the extent that candidates engage in clientelistic linkage strategies. For example, even if P chooses the policy $x_P = x_i$, voter i will attribute little or no value to this policy when G_P is very low and C_P is very high. Put simply, if candidates exert little effort in promoting and/or implementing their programmatic policy stances, voters will discount these stances accordingly. To operationalize this notion, consider the following specification of a voter's *programmatic utility* for P:

$$u_{i,P}(\text{prog}) = G_P \cdot \big(1 - abs[x_P - x_i]\big). \tag{1}$$

The term $abs[\cdot]$ denotes the absolute value function such that, holding G_P constant, as x_P moves further from x_i voter i's programmatic utility for P decreases. Simi-

[5] Both assumptions are primarily technical, and simplify the model immensely. As well, both are plausible: it seems quite natural to eliminate the possibility of an electoral strategy in which parties attempt to include extremists from both sides of the political spectrum in their target set. That said, Assumptions 1 and 2 do eliminate from candidates' action sets a series of campaign strategies which may, at least in theory, be observed empirically. In future iterations I will examine the consequences of relaxing both assumptions.

[6] The purely office-seeking assumption is the simplest of all candidate preference models. More recent research has extended the traditional spatial model to situations in which candidates also care about the policies which are implemented as a result of democratic elections (e.g. Wittman 1983; Calvert 1985). Strom (1990) represents an early attempt to explain why some candidates might be primarily office- and/or vote-seeking while others might be primarily policy-seeking.

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larly, holding x_P constant, as G_P decreases so does voter i's programmatic utility for P.[7] As a result of this functional form, the maximum programmatic utility that any voter will have for candidate P is '1'; this occurs when $G_P = 1$ and $x_i = x_P$.

In expressing voter i's *clientelistic utility* for candidate P, it is important to first distinguish between voters who are in P's target set and those who are not. We will assume that voters who are not targeted by a particular candidate simply receive a clientelistic utility of '0' from that candidate's policies. So, if candidate 1 chooses the target set $\Theta_1 = [1/4, 1/2]$, then all voters with ideal points $x_i < 1/4$ or $x_i > 1/2$ will receive a clientelistic utility of '0' from 1's campaign. What about voters who find themselves within a candidate's target set? Consider the following functional form:

$$\forall [i : x_i \in \Theta_P], \quad u_{i,P}(\text{client}) = \left\{ \frac{C_P^{\eta}}{\delta + \Theta_P} \right\}. \tag{2}$$

Beginning with (2)'s numerator, the parameter η is an exponent which we will assume to be $\eta \leq 1$. While voter i's utility will always increase with C_P, his or her marginal utility for a unit of additional clientelistic effort (weakly…) decreases as clientelistic effort increases. The notion that citizens' marginal utility for targeted policy benefits is decreasing with the extent of targeting appears frequently in political-economic models (e.g. Keefer and Vlaicu 2008). Operationally, it implies that the provision of targeted goods becomes less efficient in extremely large amounts.

Moving to (2)'s denominator, we have already defined Θ_P as candidate P's target set. Since Θ_P appears in the denominator, holding C_P constant voter i's clientelistic utility $u_{i,P}(\text{client})$ will always decrease with the size of P's target set. As candidates target more and more voters the effort level C_P must be distributed among a larger and larger population, thus reducing the *per capita* clientelistic consumption of all beneficiaries. The exogenous parameter δ represents the rate at which voters *discount* clientelistic appeals. When the discount rate δ is large, members of P's target set will receive little utility from clientelistic benefits, *even if* these benefits are extensive and narrowly targeted. When δ is small, members of P's target set may receive substantial utility from clientelistic benefits, *even if* the effort C_P is minimal and broadly targeted.

Voters' 'elasticity' to clientelistic appeals has many possible empirical determinants, including but not limited to one's income, profession, and cultural environ-

[7] The functional form in (1) implies that voters' programmatic utility for P will always be increasing in G_P. In the current model, the dimension x_P is a public good continuum; differing ideal points on x_P represent distinct preferences as to the ideal nature of public goods. Some voters may prefer national security, some environmental protection, and others free access to social services. That said, voters benefit from increased public good provision even when the nature of the good provided is not their most-preferred. Voters who prefer national security to environmental protection will nonetheless, all else held constant, benefit from reduced pollution. Formal models of public good provision often assume that voters are risk averse; if we were to assume that higher levels of G_P reduce the uncertainty surrounding parties' ability to implement national-level policies, voters' programmatic utility for P would again increase with G_P. As a result, (2) captures the type of programmatic utility of interest to this paper.

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ment. As a first cut, in this paper we will assume that δ is invariant across voters, i.e. that all voters in an electorate are similarly responsive to clientelistic appeals.[8] Also as a first cut we assume δ to be exogenous to the game itself.[9] Ultimately, translating the theoretical framework developed here into an empirical framework for the study of democratic accountability will require a careful treatment of δ's endogenous and exogenous determinants, as well as its potential for subnational variation. Nonetheless, the assumption of an invariant and exogenous δ allows us to identify a first set of comparative static arguments which differentiate between national electorates based on their *median voter's responsiveness to clientelistic campaigns*. We can thus exhaustively express a voter i's utility for party P as follows:

$$u_{i,P}(\mathbf{v}_P) = \begin{cases} G_P \cdot (1 - abs[x_i - x_P]) + \left\{\frac{C_P^{\eta}}{\delta + \Theta_P}\right\} & \text{if } x_i \in \Theta_P, \\ G_P \cdot (1 - abs[x_i - x_P]) & \text{if } x_i \notin \Theta_P. \end{cases} \tag{3}$$

Voter i will choose the candidate whose policies yield the highest utility according to (3). If candidates adopt strategies that yield i identical payoffs, then i will randomize in an unbiased way (i.e. choose each candidate with a probability of 1/2). Built into this model of voter preferences is a tradeoff between clientelistic and programmatic targeting. To see this note that $G_P = (1 - C_P)$: any and all effort not expended on programmatic campaign appeals will be allocated to clientelism. In a model without rent-seeking in which politicians receive utility only from gaining political incumbency, all effort will be spent on vote-seeking (i.e. the effort constraint will be binding). Every additional increment of effort devoted to programmatic linkage formation is thus, by definition, taken away from a candidate's clientelistic effort, and vice versa.

While our approach to modeling campaign strategies and voter preferences is substantially more complex than that found in the traditional spatial model, the game sequence itself is not. In a first stage both candidates choose a set of actions $\mathbf{v}_P = \{x_P, G_P, \underline{x}_P, \overline{x}_P\}$ so as to maximize their utility $U_P = \pi_P \cdot \beta$. In a second stage voters evaluate these actions and choose the candidate whose policies maximize their utility. For $P, \sim P \in \{1, 2\}$, given $\mathbf{v}_P$ and $\mathbf{v}_{\sim P}$ define α_P as the proportion of voters who choose P, i.e. the proportion of voters for whom either $u_{i,P}(\mathbf{v}_P) > u_{i,\sim P}(\mathbf{v}_{\sim P})$, or for whom $u_{i,P}(\mathbf{v}_P) = u_{i,\sim P}(\mathbf{v}_{\sim P})$ but whose random choice lands on P (in which case α_P is an 'expected' vote share). The election is conducted under plurality rule.

[8] Of course, empirically this is unlikely to be the case: voters within a given electorate will likely exhibit some degree of differentiation according to their socio-economic and cultural status.

[9] The model may eventually be extended to situations in which δ is endogenously determined by the set of candidate campaign strategies and voter choices. For example, one might envision δ as assuming high values among moderate voters when both parties choose extremist policies in $x_i \in [0, 1]$: the alienation which arises from political extremism may make moderates particularly susceptible to more 'cynical' electoral appeals.

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4 Clientelistic Instability

Define $\mathbf{v}_P^*$ as a *Nash Equilibrium* strategy and $\mathbf{v}_m = \{x_m, 1, \emptyset, \emptyset\}$ as the *median-voter programmatic* strategy. The latter is a strategy which essentially replicates the equilibrium choice made in Downs' original model (Downs 1957), i.e. to choose the median voter's most-preferred policy position without any effort devoted to clientelistic appeals. Begin with a situation in which candidates can target any continuous subset of voters. Although constrained by Assumptions 1 and 2 from above, this allows both candidates a good deal of freedom in choosing Θ_P.

Lemma 1 *When candidates can choose any continuous range of voter ideal points as a potential target set, in any Nash Equilibrium each candidate must win with probability* $1/2$ *(i.e. in any Nash Equilibrium* $\pi_1 = \pi_2 = 1/2$*).*

The proof of Lemma 1 is straight-forward. Consider a case in which some candidate has a greater than $1/2$ probability of winning, implying that the opposing candidate has a less than $1/2$ probability of winning. In such a case, the lower probability candidate will always have an optimal deviation: they can improve their chances of winning to $1/2$ by simply choosing a strategy identical to that of their opponent, in which case all voters are indifferent between the two parties and election is decided by a coin flip. As such, as long as candidates are unrestricted in choosing target sets, Lemma 1 obtains.

I now demonstrate the impossibility of Nash Equilibria with positive levels clientelism in these unconstrained environments.

Theorem 1 *When candidates can choose any continuous range of voter ideal points as a target set, there* ***never*** *exists a Nash Equilibrium in which* $C_P > 0$ *for either party.*

Proof of Theorem 1 Consider a situation in which P chooses a strategy $\mathbf{v}_P = \{x_P, G_P, \underline{x}_P, \overline{x}_P\}$ with $G_P < 1$ (such that $C_P > 0$) and target set $\Theta_P = [\underline{x}_P, \overline{x}_P]$. By Lemma 1, we know that any strategy vector which makes $\pi_P < .5$ or $\pi_P > .5$ will induce defection by whichever party is less likely to win the election.

What about a situation in which P chooses $\mathbf{v}_P = \{x_P, G_P, \underline{x}_P, \overline{x}_P\}$ with $G_P < 1$ and target set $\Theta_P = [\underline{x}_P, \overline{x}_P]$, and at which $\pi_P = 1/2$? In this case P's opponent $\sim P$ could choose an identical level of clientelistic effort $C_{\sim P} = C_P = 1 - G_P$, an identical policy position $x_{\sim P} = x_P$, and a nearly identical but slightly narrower target set $\Theta_{\sim P} = [\underline{x}_P, (\overline{x}_P - \varepsilon)]$ where $\varepsilon \to 0$. In so doing, P's opponent will win the support of all voters in $\Theta_{\sim P}$ (since $C_{\sim P}$ will be distributed over a slightly narrower target set than C_P). As well, all voters not in either target set will randomize, since both parties choose identical platforms and programmatic effort levels. Trivially, this implies $\pi_{\sim P} > 1/2$. Put otherwise, anytime P chooses $\mathbf{v}_P = \{x_P, G_P, \underline{x}_P, \overline{x}_P\}$ with $G_P < 1$ at which $\pi_P = 1/2$, $\sim P$ can choose $\mathbf{v}_{\sim P} = \{x_P, G_P, \underline{x}_P, \overline{x}_P - \varepsilon\}$ and increase her probability of winning.

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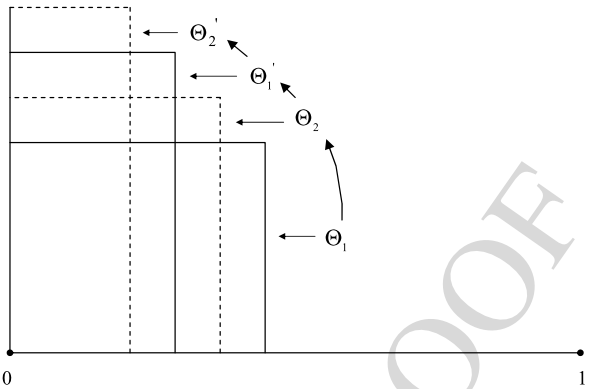

Fig. 1 Clientelistic instability

What about a strategy $\mathbf{v}_P = \{x_P, G_P, \underline{x}_P, \overline{x}_P\}$ with $G_P < 1$ and target set $\Theta_P = x_i$ (i.e. a target with only one voter type) at which $\pi_P = 1/2$. In this case P's opponent $\sim P$ could choose $\mathbf{v}_{\sim P} = \{x_P, 1, \emptyset, \emptyset\}$ and win the election with certainty: since only one voter is contained in Θ_P, all remaining voters will choose based on their programmatic utility for the respective parties. If $\sim P$ chooses $\mathbf{v}_{\sim P} = \{x_P, 1, \emptyset, \emptyset\}$, then all voters will have a higher programmatic utility for $\sim P$, since she chooses an identical platform but devotes more effort to promoting and implementing that platform (since $G_P = 1$). As such, all but the single voter in P's target set choose $\sim P$.

Taken together, these arguments demonstrate that there is no Nash Equilibrium with positive levels of clientelism when parties can choose any continuous range of voter ideal points as a potential target set. □

In words, when both candidates can target any continuous subset of voters, any choice of $C_P > 0$ induces a string of deviations in which candidates choose overlapping but slightly narrower target sets; each of these deviations leads to an increase in the deviating candidate's probability of winning. The process is displayed in Fig. 1.

Such jockeying for ever smaller target sets may continue until only the voter x_i is contained in candidates' target sets. At this point, either candidate will have the incentive to deviate and win the remaining voters' support on programmatic grounds.

Theorem 1 does not necessarily imply that the game in its most general form has no Nash Equilibrium; just that it has no clientelistic Nash Equilibrium. For sufficiently high levels of δ the game's unique Nash Equilibrium will be $\mathbf{v}_1^* = \mathbf{v}_2^* = \mathbf{v}_m$, i.e. the traditional median-voter convergence without clientelism. As an example I now derive the conditions under which $\mathbf{v}_1^* = \mathbf{v}_2^* = \mathbf{v}_m$ when $\eta = 1$. At the strategy vector $\mathbf{v}_1 = \mathbf{v}_2 = \mathbf{v}_m$ both candidates win with probability 50 %, so a deviation from this strategy vector will only be optimal if it yields the deviating candidate a greater than 50 % probability of winning. By definition any such deviation would require the deviating candidate P to choose $G_P < 1$: as long as her opponent $\sim P$ chooses $\mathbf{v}_{\sim P} = \mathbf{v}_m$, any deviation which involves choosing a different policy position without clientelist targeting costs P the election (Downs 1957).

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To identify whether or not a deviation from $\mathbf{v}_m$ to some $\mathbf{v}_P = \{x_P, G_P, \underline{x}_P, \overline{x}_P\}$ will yield P a value of $\pi_P > 50$ %, I adopt the following procedure: I first identify, for any level of $G_P < 1$, the accompanying policy platform and target set deviations which would represent the *necessary condition* deviations, denoted as $\hat{x}_P(G_P)$, $\underline{\hat{x}}_P(G_P)$, and $\hat{\overline{x}}_P(G_P)$. To elaborate, note that as long as voters value clientelism enough (i.e. δ is small enough), there may be many deviations from $\mathbf{v}_m$ which yield $\pi_P > 50$ %. Necessary condition deviations are defined here as follows: for any level of $G_P < 1$, if deviating to the choices $\hat{x}_P(G_P)$, $\underline{\hat{x}}_P(G_P)$, and $\hat{\overline{x}}_P(G_P)$ *does not* yield the deviating candidate P a probability of winning $\pi_P > 50$ %, then for that level of $G_P < 1$ *there does not exist* a set of choices which yields $\pi_P > 50$ %. Denote $\hat{\Theta} = [\underline{\hat{x}}_P(G_P), \hat{\overline{x}}_P(G_P)]$. The following lemma establishes $\hat{x}_P(G_P)$, $\underline{\hat{x}}_P(G_P)$, and $\hat{\overline{x}}_P(G_P)$ for all values of $G_P < 1$:

Lemma 2 *When $\eta = 1$, for any deviation from $\mathbf{v}_m$ to a value $G_P < 1$, the accompanying necessary condition parameters are $\hat{x}_P(G_P) = x_m$ and a target set that includes any bare plurality of voters (any Θ such that $\overline{x}_P - \underline{x}_P = .5 + \varepsilon$, where $\varepsilon \to 0$).*

So, the most flexible deviation from $\mathbf{v}_m$ actually involves maintaining x_m as a platform, and targeting C to any bare plurality of voters. Lemma 2 (proof in the Appendix) establishes that, for any deviation from $\mathbf{v}_m$, if the accompanying choice $\hat{x}_P(G_P) = x_m$ and *any* bare plurality target set *does not* yield the deviating candidate P a probability of winning $\pi_P > 50$ %, then for that level of $G_P < 1$ *there does not exist* a set of accompanying choices which yields $\pi_P > 50$ %. Consider the case in which $\delta = 0$, and in which P chooses a deviation to $G_P = .4$. Clearly, in this case adopting the necessary condition strategies would allow P to win the election with certainty: all voters in the bare majority target set would receive $u_{i,P}(\text{client}) = .6/.5 = 1.2$. Of all voters in this target set, the median voter will be the hardest to win over, because she receives $u_{i,\sim P}(\text{prog}) = 1$ from $\sim P$ (since $\mathbf{v}_{\sim P} = \mathbf{v}_m$). Since $1.2 > 1$, the median voter and all voters in the target set would choose P on the basis of clientelist utility alone, making $\pi_P = 1$.

However, if $\delta = 0$ then P could also deviate to the strategy $\mathbf{v}_P = \{.4, .4, 0, .6\}$ and win the election with certainty. By choosing the platform $x_P = .4$ and allocating $C_P = .6$ to the target set $\Theta_p = [0, .6]$, all voters in the target set receive $u_{i,P}(\text{client}) = 1$. Of all voters in this target set, the median voter will be the hardest to win over, because she receives $u_{i,\sim P}(\text{prog}) = 1$ from $\sim P$ (since $\mathbf{v}_{\sim P} = \mathbf{v}_m$). The median voter receives $u_{i,P}(\text{prog}) = .4 \times .9 = .36$ from the strategy $\mathbf{v}_P = \{.4, .6, 0, .6\}$, and as such receives total utility $1 + .36 > 1$, so she will vote for the deviating candidate P. A similar comparison demonstrates that all additional voters in the target set $\Theta_p = [0, .6]$ will also prefer P's new strategy, such that a deviation to $\mathbf{v}_P = \{.4, .6, 0, .6\}$ to allows P to win the election with certainty against an opponent at $\mathbf{v}_{\sim P} = \mathbf{v}_m$.

Thus, when $\delta = 0$, for any value of G_P there will be a *large set of deviations* from $\mathbf{v}_1 = \mathbf{v}_2 = \mathbf{v}_m$ which allow the deviating candidate to win the election with certainty. Lemma 2 doesn't tell us, in equilibrium, which of these deviations would be adopted; indeed, the candidate in question will be indifferent between any set

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of deviations which increases her probability of winning to 100 %. What Lemma 2 tells is that, for any value of $G_P < 1$, if the deviation from $\mathbf{v}_m$ to $\hat{x}_P(G_P) = x_m$ and a bare plurality target set does not increase P's probability of winning, then there does not exist an payoff-improving deviation for that level G_P. This leads to the following result:

Proposition 1 *When* $\eta = 1$, *if* $\delta \geq 1/2$ *then* $\mathbf{v}_1^* = \mathbf{v}_2^* = \mathbf{v}_m$, *and if* $\delta < 1/2$ *then the game has no Nash equilibrium.*

The Appendix contains the proof. For any value of $\delta < 1/2$ at least one deviation exists which grants the deviating party $\pi_P > 50$ %. For any value of $\delta \geq 1/2$ no such deviation exists. If a deviation does exist (i.e. if $\delta < 1/2$) this sets in motion the strategic dynamic uncovered in Theorem 1, by which both parties continually cut into one another's target sets, until both parties eventually end up back at the median-voter programmatic strategy vector $\mathbf{v}_m$. This in turn sets in motion another series of deviations, and so on *ad infinitum*. As such, when $\delta < 1/2$ the two parties cycle infinitely between the competing linkage strategies, and the game has no Nash Equilibrium. While numerically different, the same qualitative implications obtain regardless of the value of η: at high levels of δ the game's Nash Equilibrium will be $\mathbf{v}_1^* = \mathbf{v}_2^* = \mathbf{v}_m$, and at lower levels the game will have no Nash Equilibrium.

5 Discussion

The absence of Nash Equilibria with positive levels of clientelism in the most general model arises from the fact that candidates can continually usurp their opponent's clientelistic supporters by adopting overlapping but distinct target sets. This result is related to general instability results in non-cooperative models of coalition formation (see Humphreys 2008 for an excellent review). Early research on the subject came primarily in the form of cooperative game theory (Nash 1953), and among other things tended to uncover the potential for theoretical instability and cycling in coalitional processes. While non-cooperative approaches initially generated greater theoretical stability (though often Nash equilibria were not unique), recent work introducing sequential bargaining strategies has once again uncovered the possibility for theoretical instability in coalition processes. Both the existence of stable equilibria and the properties of stable coalitions depend, crucially, on the assumptions one makes regarding the set of 'allowable' coalitions; and in turn this set of allowable coalitions is dependent on the commitment technologies with which one endows strategic actors (Humphreys 2008, p. 377).

With regards to the model above, the notion of 'allowable' coalitions can be thought of as the set of voters we allow electoral candidates to target with clientelistic goods. Assumptions 1 and 2, which are primarily technical, serve as preliminary restrictions on the set of allowable clientelistic coalitions which can form. However, Theorem 1 above demonstrates that, without additional restrictions, no set of clien-