Patronage, Groups and Pivotal Voting*

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Abstract

In contrast to traditional approaches to patronage politics, in which politicians directly buy electoral support from individuals, we examine how parties can elicit wide spread electoral support by offering to allocate benefits to the group giving it the most support. Provided that the party can observe group level voting, this mechanism, which eliminates the need to observe individual votes or to reward a large number of individual voters, incentivizes voters to support a party even when the party enacts policies which are against their interests. When a party allocates rewards contingent upon group-level voting results, voters can be pivotal both in terms of affecting who wins the election and in influencing which group gets the benefits. The latter (prize pivotalness) dominates the former (outcome pivotalness), particular once a patronage party is anticipated to win. By characterizing voting equilibria in such a framework we explain the rationale for the support of patronage parties, voter turnout and the endogenous political polarization of groups.

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INTRODUCTION

We investigate two questions central to understanding electoral politics. One asks, why do people vote? As many rational choice critics argue, a vote really only matters if it is decisive, breaking a tie between candidates (Riker and Ordeshook 1968; Barzel and Silberberg 1973; Tullock 1967; Greene and Shapiro 1996; Beys 2006). For a non-trivially sized electorate, the odds of being the tie-breaking voter are near zero. With the voter having almost no chance of altering the electoral outcome, the cost of voting, even though small, is still likely to exceed its expected value. A second question focuses on voters, asking what determines how they choose between candidates. Debate in this arena revolves around three bases for choosing for whom to vote: (1) to fulfill some psychological or other source of affinity that leads people to identify with one or another political party across elections (Campbell, Converse, Miller and Stokes 1960; Beck 1992; Bartels 2000; add citations); (2) to support parties and candidates whose policies the voter favors (Fiorina 1981; Poole and Rosenthal 1985, 1991; add citations); or (3) to gain personal patronage rewards or local benefits in the form of pork in exchange for voter support (Ferejohn 1974; Fenno 1978; Schwartz 1987; Stokes 2005). We offer a game theoretic solution to these puzzles.

The paper proceeds as follows. In the next section we review critical features of the literature on voting, tying it to the literature on patronage and pork barrel politics. Then we introduce our basic model. The model distinguishes between two ways that a voter can be pivotal (Schwartz 1987): (1) in the sense of tipping the outcome of the election one way or the other; and (2) in the sense of providing sufficient electoral support to the winning candidate or party that the voter's group – a discernible voter bloc such as a ward or precinct – gets pork or patronage benefits that it otherwise would not have gotten. Having examined these concepts of pivotalness, we first derive symmetric voting equilibria. In these equilibria, voters can rationally support parties even when the policies of those parties harm their welfare. Further in these equilibria voters also want to turnout. We then discuss asymmetric voting equilibria in which each group supports the parties at a different rate. We show that asymmetric voting equilibria can produce different turnout rates across the different groups. Further the motivation to support one party rather than another can differ substantially between groups such that one group might vote primarily upon policy difference between the parties, while the vote choice in another might be primarily motivated by pork and patronage.

The model's pricipal conceptual innovation is to introduce the idea of contingent prize allocation rules. [Two types of parties: rewards rather than public policy dispensers and reformist, public goods oriented parties. Fenno's distinction between home style Call former patronage parties; call latter reformist parties. Of course, in reality parties reflect different mixes of these two characteristics (Fenno).] –> probably delete this sentence: Rather than assume parties compete solely in terms of public policy or buying individual voters through patronage rewards, parties are modeled as offering rewards to the most supportive group or groups. By making the allocation of rewards, or prizes, contingent on group-level support, a party incentivizes groups to coordinate on supporting it. A contingent prize allocation rule converts voting into a competition to show the greatest loyalty to the party expected to win election. Further, precisely because this pivotal patronage mechanism works by creating intergroup competition to express the greatest loyalty, it does not suffer from credibility concerns that often arise in studies of patronage and pork barrel politics. Optimal policies for patronage parties depend on whether they buy individual votes or utilize a contingent prize allocation scheme as described in the voting game. We show how the contingent prize allocation scheme resolves credibility and time consistency issues. Parties that use a contingent prize allocation rule implement higher tax rates, larger prizes and fewer public goods than parties that directly buy individual votes. This discussion provides an explanation for some patronage-based democratic systems, like Tanzania or India, that emulate the corruption and inefficiency conditions of more autocratic regimes. Although all the voters might recognise that they would be better off under a reformist party's rule, established patronage parties persist because each of the voters wants the reformist party elected but with someone else's vote. We conclude by discussing the implications of our model and offering simple, practical policy advice for eliminating political patronage.

PATRONAGE, GROUPS AND PIVOTAL VOTING

Although it is agreed that voters are unlikely to be pivotal in shaping who wins election, still much of the literature assumes that voters have a dominant incentive to vote as if their vote matters. A number of scholars (for instance Morton 1991 and Shachar and Nalebuff 1999) focus on group rationality and the incentives to follow leaders and argue that this increases voting. Huckfeldt and Sprague (1995) find that socialization is an important component of how people vote. Our focus on a contingent prize allocation rule creates an incentive, as we will see, to vote even when the voter has little chance of altering the electoral outcome. In focusing on contingent prizes we integrate the literatures on pivotal voting and patronage and provide an endogenous explanation of the links between patronage and pork barrel politics, bloc voting, turnout, voter polarization and policy choice.

We build on a seminal article in which Schwartz (1987) provides a plausible counter-argument to those who contend that voting is irrational. He agrees, of course, that each voter has a neglible probability of being pivotal in the election as a whole, but he notes that such a voter might well be pivotal in determining whether her precinct, or other sub-district jurisdiction, supports a particular candidate. If candidates reward supportive precincts, then although the individual voter might be insignificant in the election as a whole, still her support might strongly influence the allocation of benefits in a smaller, local jursidiction such as an individual precinct. Indeed, he suggests that voters, tempted by the chance to gain pork or patronage benefits, might even vote for a party they do not favor if it is expected to win election anyway. Schwartz shows that his decision theoretic assessment is more consistent with the evidence for voter turnout than are alternative accounts of the rationality of voting (Downs, 1957; Riker and Ordeshook 1968; Ferejohn and Fiorina 1974, 1975).

Schwartz's critical insight was to expand the debate about the rationality of voting to include what we refer to as prize pivotalness rather than just outcome pivotalness. Our analysis expands on Schwartz's arguments, placing the choice of whether to vote and if so, how to vote, in a strategic setting. By encapsulating voting in a game theoretic setting, with group level benefits that are contingent on the level of localized support, we are able to deduce broad political principles. Like Schwartz (1987), we show how the expectation of patronage and pork benefits can explain voter turnout and voter support even for parties disliked by the voters. In our model, however, these results are parts of equilibrium strategies, with these strategies uncovering many additional implications. For instance, the game also demonstrates that parties/candidates are better off using a localized contingent prize allocation rule (as explained in the next section) over a reformist political agenda; that high taxes and diminished public goods provision results from patronage and pork-barrel voting; that (rational) equilibrium voting strategies include choosing to vote on the basis of party identification or other forms of straight party-line voting, voting on the basis of strong policy preferences, voting to gain patronage and pork, or voting in response to different mixes of these voter incentives. The strategic setting explains variation in turnout, polarization of political parties and voters, and provides implications about term limits, gerrymandering and many other features of electoral politics not addressed in Schwartz's decision-theoretic analysis.

As in Schwartz's model, our perspective focuses attention on patronage and pork barrel politics. By patronage we mean the granting of favors and rewards by politicians in exchange for electoral support. Patronage is generally viewed within the literature as bad for economic performance and for democracy and is often linked to emerging, rather than established, democracies (Stokes 2007; Kitschelt and Wilkinson 2007, ch. 1). Stokes (2007) and Kitschelt and Wilkinson (2007, ch 1) offer excellent reviews of the patronage literature. Although prevalent throughout the world, it is generally regarded as a feature especially common in recently democratized nations (Malloy and Seligson 1987; Keefer 2007). Patronage is also associated with poverty (Chubb 1982; Wilson and Banfield 1963; Calvo and Murillo 2004; Dixit and Londregan 1996; Medina and Stokes 2007.). Perhaps perversely, since patronage has been found to impede economic growth and hinder the provision of public goods (Barndt, Bond, Gerring and Moreno 2005), incumbent patronage parties still tend to win elections. This is true even when they are acknowledged to be less popular than the opposition (Magaloni 2006). What is more, patronage-based politics are not limited to third-world settings or to emerging democracies. It can remain a persistent feature of governance even in long established and wealthy democracies. For instance, Scott (1969) observed that the working of big city political machines within the US, such as Tammany Hall, are virtually identical to parties in emerging democracies.

Patronage is an effective way to garner political support when voting lacks anonymity. The widespread introduction of the so-called Australian ballot, an official ballot produced by the state rather than provided by parties, has made it harder for parties to verify voter choice (Stokes 2007, 620-1). Despite these changes, parties have found ingenious ways to undermine anonymity. For instance, early voting machines in New Jersey in the 1890s made different noises depending upon how votes were cast. Chandra (2004) documents how parties in India discern voter choice by frequently emptying the ballot box to provide an ongoing count of the votes. Despite these tricks, the secret ballot has greatly reduced the ability of parties to monitor individual votes. Yet, patronage parties persist. They have, of course, adapted to the impediments secret ballots put in their way. Pork barrel politics, which we refer to throughout as a special form of patronage, focuses benefits on a discernible set of voters, such as those in a ward or precinct, rather than on individual voters.

The literature recognizes time consistency and credible commitment as crucial features of pork and patronage (Ferejohn 1987; Stokes 2007). Parties offer rewards in exchange for votes. Individuals promise to vote for a party in exchange for material benefits. Once elected, the party no longer wants to hand over rewards, and once rewarded the voters can renege on their promise. The anonymous ballot makes the credibility problem even harder to resolve because the party can not verify whether the voter held up her or his end of the deal. Norms and reciprocity have been proffered to solve the credibility dilemma (See Stokes 2007 and Kitschelt and Wilson 2007 for reviews) but some issues remain unresolved. Even discounting the credibility issue, direct exchanges between a party and individuals cannot fully account for widespread popular support because the patronage-oriented party in standard accounts does not give bribes to everyone and in many cases the value of the bribes is very low. Stokes (2005 p. 315) illustrates the problem by citing the example of the Argentinian party worker given ten tiny bags of food with which to buy the 40 voters in her neighborhood. Further there is evidence that those who receive rewards are no more likely to support the party than those who do not (Brusco, Nazareno and Stokes 2004). The pivotal patronage explanation we offer resolves these difficulties. It does so by relying on the use of carefully targeted pork rather than individual patronage.

In our account, pork is targeted based on a *contingent prize allocation rule*: benefits (individual and collective; that is, patronage and pork) go to the discernible electoral groups, such as precincts, that give the winning party the greatest support rather than only to individual voters or to the winning candidate's entire constituency. The group-prize mechanism requires that groups be identifiable; that the level of electoral support from each group is observable; and that parties can offer rewards that selectively benefit particular groups. Electoral precincts are one example of groups that fulfill these criteria. Votes are counted at the precinct level and parties can allocate projects to one geographical precinct over another. However, the theory is equally applicable to any other societal groupings that satisfy these criteria, whether these groups are based on linguistic, religious, ethnic or economic divisions. That is, the theory is about bloc identification and rewards. Electoral precincts are simply an easy-to-observe vehicle for allocating patronage prizes. Here we emphasize the development of the theory. Although the model fits several well-established empirical regularities and also suggests new, testable hypotheses, we do not investigate these here. In later work we hope to address many of these empirical implications.

A BASIC MODEL OF PATRONAGE AND PIVOTAL VOTING

The model assumes three groups or voting blocs which, for convenience, we refer to as electoral precincts. We identify the three groups (precincts) as G_1, G_2 and G_3. We assume two political parties, A and B, each of which tries to maximize its chance of winning an election. The parties can observe the vote totals from each group, but they can not observe individual votes. If party A allocates political rewards (prizes) on the basis of the number of votes each group produces, then voters can be pivotal in two senses. First, voters might be pivotal in the traditional sense of determining which party wins – *outcome pivot*. This should be thought of as the pivotality of central concern in the rational voting literature. Second, voters can be pivotal in deciding which group (or voting unit) provides the party with the most support, and hence receives the prize –*prize pivot*. As we shall see, prize pivot dominates outcome pivot in voter choices over parties. Within the three group case we show that with a contingent prize allocation rule in place, even when there is a hegemonic party supported by all voters, so that each voter has zero influence over the electoral outcome (that is, voters are not outcome pivotal), the voter's incentive to vote for the hegemonic party is equal to one third of the value of the prize. As we will see, this incentive is driven by the voter's influence over the allocation of the prize; that is, the voter's prize pivot.

There are n (odd) voters in each of the groups. To win the election, party A needs to win a majority of the votes, that is at least $(3n + 1)/2$ votes. All votes count equally but votes are reported by group. Parties can not observe how individuals vote; however, they observe electoral results by group or precinct. Parties A and B induce patronage support by promising to reward the precinct that gives it the most support; that is, by promising a prize *contingent* on electoral support. Later we explain why this promise is credible.

Voters care about two things in choosing who to vote for: policy and prizes.[1] Let α be the common voter assessment of the policy-based value of party A relative to party B. In addition to the common benefit, each voter, i, receives ε_i benefits if party A is elected. Voters know their own evaluation of party A, but they do not know the values held by other voters. We assume that each voter's evaluation of party A is independent, with expected value of zero. In particular, we assume that $\Pr(\varepsilon_i < x) = F(x)$, with associated density $f(x)$, which has full support on the real line and is symmetric about zero. The symmetry assumption is not substantively important. Rather we utilize the fact that $1 - F(x) = F(-x)$ in order to simplify mathematical expressions. In all the examples that follow we assume that ε_i is logisitically distributed: $F(x) = e^{-x}/(1 + e^{-x})$.

In addition to policy benefits from the competing parties, voters care about what the parties will give to them or their group. Patronage parties offer political rewards which we refer to as prizes: parties A and B hand out prizes worth Θ_A and Θ_B

[1] Below we relate these incentives to a voting strategy consistent with strong party identification; that is, a pure voting strategy that leads the voter always to choose the same party.

depending upon which party wins. These prizes could take many forms. This could be local goods or services, commonly referred to as portk or it could be individual private rewards, such as standard patronage quid-pro-quo deals randomly allocated to members of the group. [The latter are more likely to have credibility issues than the former.]

Patronage parties offer jobs and superior services to supporters. They might choose to locate a new school, road or health clinic where it preferentially benefits one group more than another. For convenience we shall think of the prize as a local public good for the precinct that receives it (See Kitschelt and Wilkinson 2007 p. 10-12, 21 for a discussion of types of rewards). If, for instance, party A wins the election and gives the prize to group G_1, then all members of group G_1 receive value Θ_A and the members of the other groups get nothing (even if they also voted, albeit less strongly, in favor of party A). For the time being we assume the size of the prize is fixed and examine the consequences of how it is allocated. Later we examine the trade-off between the provision of public goods, g, and prizes, Θ.

Our primary goal is to understand how a contingent prize allocation rule shapes vote choice within and across groups. We characterize Nash equilibria, where a voting strategy is defined as follows: if voter m's evaluation of party A is ε_m then m's strategy is to vote for party A with probability $\sigma_m(\varepsilon_m)$. Given such a strategy, the probability that voter m supports party A is $p_m = \int_{-\infty}^{\infty} f(\varepsilon_m)\sigma_m(\varepsilon_m)d\varepsilon_m$.

Outcome Pivot, Prize Pivot

Because parties do not see individual votes, they can not allocate prizes based upon individual votes. However they can compare the level of support across different groups (e.g., voter blocs, precincts) and reward the group that produces the most votes by allocating the prize to it. This creates competition to be the most supportive group.

While an individual's influence over which party wins an election is small, the voter can remain highly pivotal in the allocation of the prize if a party uses a contingent prize allocation rule.

Unfortunately, due to their opaque nature, it is often difficult to discern the internal workings of patronage parties (Guterbock 1980, p15). Still, sometimes we are able to observe party rules that are structured to reward supportive groups in much the manner assumed here. For example, Gosnell (1939 p29) describes how in Chicago the size of each ward's Democratic vote directly translated into its influence on various Democratic committees. If, for instance, one ward produced twice the Democratic votes as another then its ward leader would have twice the votes within the internal deliberations of the Democratic party and therefore a much greater opportunity to send rewards back to his ward. Such a system institutionalizes the mapping between electoral support and the allocation of rewards.

Similar biases exist at the national level in the U.S. For instance, the rules of the Democratic Party's national convention reward the states that provided the highest level of support to the Democrats in previous elections. In particular, each state's share of the 3000 democratic delegates is calculated by the following allocation formula: "$A = \frac{1}{2}(\frac{SDV1996+SDV2000+SDV2004}{TDV1996+TDV2000+TDV2004} + \frac{SEV}{538})$, where A = Allocation Factor, SDV = State Democratic Vote, SEV = State Electoral Vote, and TDV = Total Democratic Vote (Democratic Party Headquarters 2007 p1)." The Republican party uses a more complicated system which allocates delegates on the basis of Republican support in previous state and federal elections (for details see Republican National Convention 2008). In both cases, parties use a contingent rule to assign the prize– in this case influence over picking Presidential candidates.

Parties can also allocate punishments according to electoral support. In Southern Italian cities, the Christian Democrats threatened merchants with health code violations if they did not support the party (Chubb 1982). Singapore's Lee Kuan Yew was notorious for punishing electoral districts by removing public housing benefits if the district did not overwhelmingly support him (Tam 2003). In Zimbabwe Robert Mugagbe has gone even further. He bulldozed houses and markets in those areas which supported opposition candidates (BBC 2005). Clearly, some parties allocate rewards and punishments based upon electoral support. An objective of this paper is to see the consequences on voting behavior of such contingent prize allocation rules.

We examine the following simple contingent prize allocation rule in which the winner gives the prize to the group that provided the greatest level of support. If party A's vote totals from groups G_1, G_2 and G_3 are i, j and k respectively, then the probability that party A allocates the prize to group $G_1$is $Q_A(i,j,k)$, where

$$Q_A(i,j,k) = \begin{cases} 1 & if \quad i > j \text{ and } i > k \text{ and } i+j+k \geq (3n+1)/2 \\ 1/2 & if \quad i = j \text{ and } i > k \text{ and } i+j+k \geq (3n+1)/2 \\ 1/2 & if \quad i > j \text{ and } i = k \text{ and } i+j+k \geq (3n+1)/2 \\ 1/3 & if \quad i = j \text{ and } i = k \text{ and } i+j+k \geq (3n+1)/2 \\ 0 & if \quad (i < j \text{ or } i < k) \text{ or } i+j+k < (3n+1)/2 \end{cases}$$

$Q_A(i,j,k)$ describes G_1's chance of receiving the prize. Group G_1's prize share depends upon two factors: how many votes G_1 generates for A relative to the other groups and whether A gets enough votes to win the election.[2]

As the examples above illustrate, there are many allocation rules which are contingent upon electoral support. Here we analyze the single simple rule in which a party gives a prize to the group which gives it the most support. However, we envision extensions to compare the properties of different contingent prize allocation rules in a manner similar to the tournaments literature which examines how different compensation and promotion policies elicit different effort levels (Gibbons 1996; Lazear 1995; Lazear and Rosen 1981; Prendergast 1996; Rosen 1986).

[2]One important extension of the model is to suppose parties can allocate prizes whether they win the election or not. Particularly in a federal system, parties might use resources obtained at one level of electoral competition to reward voting at another level.

The key to a contingent prize allocation rules is, as noted earlier, that voters can be *outcome pivotal* and they can be *prize pivotal.* We now formally develop the concepts of outcome pivot and prize pivot, restricting our attention to equilibria that are symmetric within group, in the sense that all members of a group adopt the same strategy.

Voters from groups G_1, G_2 and G_3 support party A with probabilities p_i, p_j and p_k. Let W_A represent the probability that party A will win the election if voter m from G_1 votes for A. Similarly, let W_B represent the chance A wins if m votes for B. For presentational convenience, throughout we show these calculation from the perspective of a representative voter m from group G_1 and assume that all member of a group have the same voting strategy. However, this latter assumption can be readily relaxed.[3]

$$W_A = \sum_{i=0}^{n-1}\sum_{j=0}^{n}\sum_{k=0}^{n} \tfrac{(n-1)!}{(n-1-i)!i!} p_i^i (1-p_i)^{(n-1-i)} \tfrac{(n)!}{(n-j)!j!} p_j^j (1-p_j)^{(n-j)} \tfrac{(n)!}{(n-k)!k!} p_k^k (1-p_k)^{(n-k)} 1_{i+j+k+1 \geq (3n+1)/2} \quad (1)$$

This equation deserves some explanation. The calculation is made from the perspective of a representative voter m from group G_1. The expression is a summation over all the possible vote combinations in the three groups. The term $\frac{(n-1)!}{(n-1-i)!i!} p_i^i (1-p_i)^{(n-1-i)}$ is the probability that i of the $n-1$ other voters in G_1 vote for party A

[3] We focus on symmetric equilibria in which all voters in the same group play the same strategy. However, if voters within groups use different strategies and vote for A ($z_i = 1$) with probability p_i then pivot probabilities can be obtained from the following generalized definitions:

$$APrize_A = \sum_{z_1\{0,1\}}\sum_{z_2\{0,1\}} ... \sum_{z_{3n}\{0,1\}} [p_1^{z_1}(1-p_1)^{1-z_1} p_2^{z_2}(1-p_2)^{1-z2} ... p_{3n}^{z_{3n}}(1-p_{3n})^{1-z_{3n}} Q_A(1 + \sum_{i\in G_I/m} z_i, \sum_{j\in G_J} z_j, \sum_{k\in G_k} z_k)]$$

$$W_A = \sum_{z_1\{0,1\}}\sum_{z_2\{0,1\}} ... \sum_{z_{3n}\{0,1\}} [p_1^{z_1}(1-p_1)^{1-z_1} p_2^{z_2}(1-p_2)^{1-z2} ... p_{3n}^{z_{3n}}(1-p_{3n})^{1-z_{3n}} 1(1 + \sum_{i\in G_I \cup G_J \cup G_k/m} z_i \geq \tfrac{3n+1}{2})]$$

and analogous expressions for other terms.

given that each voter in G_1 individually votes for A with probability p_i. This formula is taken directly from the binomial theorem. There are analogous expressions for the number of votes for A in groups G_2 and G_3. The function $1_{i+j+k+1\geq(3n+1)/2}$ is an indicator function which takes value 1 when A wins the election, that is when $i+j+k+1$ is at least $(3n+1)/2$ votes for party A. This indicator function takes value zero when B gets more votes than A. Hence W_A is the probability that party A wins if voter m supports it.

If m votes for party B then A receives one fewer votes than in the above case. Therefore party A's probability of winning election, W_B, is

$$W_B = \sum_{i=0}^{n-1}\sum_{j=0}^{n}\sum_{k=0}^{n} \tfrac{(n-1)!}{(n-1-i)!i!} p_i^i (1-p_i)^{(n-1-i)} \tfrac{(n)!}{(n-j)!j!} p_j^j (1-p_j)^{(n-j)} \tfrac{(n)!}{(n-k)!k!} p_k^k (1-p_k)^{(n-k)} 1_{i+j+k\geq(3n+1)/2} \quad (2)$$

We define outcome pivotalness, OP, as the difference between W_A and W_B. OP represents the traditional concept of pivotalness and is the probability that m's vote changes the electoral outcome.

$$OP = W_A - W_B = \sum_{i=0}^{n-1}\sum_{j=0}^{n}\sum_{k=0}^{n} \tfrac{(n-1)!}{(n-1-i)!i!} p_i^i (1-p_i)^{(n-1-i)} \tfrac{(n)!}{(n-j)!j!} p_j^j (1-p_j)^{(n-j)} \tfrac{(n)!}{(n-k)!k!} p_k^k (1-p_k)^{(n-k)} 1_{i+j+k=(3n-1)/2} \quad (3)$$

In addition to determining the electoral winner, a voter's decision can also alter how the winning party distributes the prize. Under the simple contingent prize allocation rule, $Q(i,j,k)$, voter m's group wins the prize if it offers A the greatest level of electoral support. Given the probabilities with which other voters support A, we can calculate the likelihood of m's group winning the prize if she votes for A and if she votes for B. We define $APrize_A$ as the probability that voter m's group (G_1) receives the prize from party A if m votes for party A:

$$APrize_A = \sum_{i=0}^{n-1}\sum_{j=0}^{n}\sum_{k=0}^{n} \tfrac{(n-1)!}{(n-1-i)!i!} p_i^i (1-p_i)^{(n-1-i)}$$

$$\tfrac{(n)!}{(n-j)!j!} p_j^j (1-p_j)^{(n-j)} \tfrac{(n)!}{(n-k)!k!} p_k^k (1-p_k)^{(n-k)} Q_A(i+1, j, k)$$

Alternatively, if m votes for B, then the chance that m's group receives the prize from A is $APrize_B$.

$$APrize_B = \sum_{i=0}^{n-1}\sum_{j=0}^{n}\sum_{k=0}^{n} \tfrac{(n-1)!}{(n-1-i)!i!} p_i^i (1-p_i)^{(n-1-i)}$$

$$\tfrac{(n)!}{(n-j)!j!} p_j^j (1-p_j)^{(n-j)} \tfrac{(n)!}{(n-k)!k!} p_k^k (1-p_k)^{(n-k)} Q_A(i, j, k)$$

The probability of receiving the prize from A is monotonic in m's vote choice, $APrize_A \geq APrize_B$, because $Q_A(i+1, j, k) \geq Q_A(i, j, k)$. We define prize pivotalness, PP_A, as the difference between $APrize_A$ and $APrize_B$. It reflects how m's vote for A or B affects the likelihood of m's group receiving the prize from A.

$$PP_A = \sum_{i=0}^{n-1}\sum_{j=0}^{n}\sum_{k=0}^{n} \tfrac{(n-1)!}{(n-1-i)!i!} p_i^i (1-p_i)^{(n-1-i)}$$

$$\tfrac{(n)!}{(n-j)!j!} p_j^j (1-p_j)^{(n-j)} \tfrac{(n)!}{(n-k)!k!} p_k^k (1-p_k)^{(n-k)} (Q_A(i+1, j, k) - Q_A(i, j, k))$$

There are analogous expressions for B's prize allocation, $BPrize_A$, $BPrize_B$ and PP_B.

PP_A represents the difference in the expected share of the prize that group G_1 receives if voter m votes for A rather than B. If party A makes its allocation of the prize contingent upon voter support, then voters are pivotal in two senses. Their votes could alter the outcome of the election and alter the distribution of the prize. Much of the intuition for our arguments can be gained by examining voter m's pivotalness.

Assuming that all voters are equally likely to support party A ($p = p_i = p_j = p_k$), figure 1 plots outcome pivot OP and prize pivots (PP_A and PP_B) as a function of p – the individual likelihood of voting for party A – and the number of voters. The solid lines represent outcome pivot OP. The dotted and dashed lines represent prize pivot for A and B respectively, PP_A and PP_B. Figure 1 displays pivot probabilities when the number of voters per precinct is 3 (upper lines) or 33 (lower lines). The horizontal axis plots p, the probability with which voters support party A.

Figure 1 about here

Outcome pivot, OP, drops off very quickly as n increases (lower solid line shows change in OP as a function of p when n is 33; the upper solid line shows the relationship between OP and p when n is 3 per precinct), particularly when p is not close to $\frac{1}{2}$. Likewise prize pivot, PP_A, declines as the size of the electorate grows (again lower lines compared to upper lines). However, provided that $p > 1/2$ (that is, voters are more likely to vote for A than not), the impact of a voter's decision on the allocation of the prize remains substantially greater than 10% even when the electorate increases to 99 voters (that is, 33 per precinct with 3 precincts). Further, as the individual probability of voting for party A approaches one then prize pivot converges to a third (as $p \rightarrow 1$, $PP_A \rightarrow \frac{1}{3}$). This result is independent of the size of the electorate (but not, of course, to the number of precincts).[4] Hence while the probability of being outcome pivotal becomes vanishingly small as the electorate becomes large, this diminution of pivotalness is not true in terms of the allocation of the prize.

VOTING DECISIONS

Our analyses characterize Nash equilibria in the voting game. Given the probability with which each of the other $3n - 1$ voters vote for A, we examine the vote choice of representative voter m from group G_1. If m votes for party A, then her expected payoff is $U_m(VoteA) = W_A(\alpha + \varepsilon_m) + APrize_A\Theta_A + BPrize_A\Theta_B$. Alternatively if m votes for B her expected payoff is $U_m(VoteB) = W_B(\alpha + \varepsilon_m) + APrize_B\Theta_A + BPrize_B\Theta_B$. Voter m supports A when $U_m(VoteA) - U_m(VoteB) \geq 0$. If $OP > 0$ then $U_m(VoteA) - U_m(VoteB)$ is strictly increasing in ε_m. In this case voter m's best response is fully characterized by a threshold τ_m, where τ_m is the value of ε_m for which the value of voting for A equals the value of voting for B.

[4] In general, if there are S groups then $PP_A \rightarrow 1/S$. How many groups a constituency should be divided into is an important political question which we hope to addres in a future paper.

$$U_m(VoteA) - U_m(VoteB)$$
$$= (W_A - W_B)(\alpha + \tau_m) + (APrize_A - APrize_B)\Theta_A + (BPrize_A - BPrize_B)\Theta_B$$
$$= OP(\alpha + \tau_m) + PP_A\Theta_A + PP_B\Theta_B = 0 \tag{4}$$

Since ε_m has full support, if $OP > 0$ there always exists τ_m that satisfies equation 4. If $\varepsilon_m > \tau_m$ then $\sigma_m(\varepsilon_m) = 1$; otherwise $\sigma_m(\varepsilon_m) = 0$. We refer to such a strategy as a threshold strategy. If m uses a threshold strategy then the probability that she votes for A is $p_m = \Pr(\varepsilon_m > \tau_m) = 1 - F(\tau_m) = F(-\tau_m)$.

Threshold strategies are not the only plausible voting strategies. Voters might always vote for one party independent of their evaluation of the other parties. This might be true, for instance, because of a strong psychological identification with one party over the other (Campbell et al 1960). We define Z_A as the set of voters who always vote for A (independent of their evaluation of A): $Z_A = \{m \in G_1 \cup G_2 \cup G_3$ such that $\sigma_m(\varepsilon_m) = 1$ for all $\varepsilon_m\}$. We let Z_{A1} represent the set of voters from group G_1 who always vote for A: $Z_{A1} = Z_A \cap G_1$. Similarly, $Z_B = \{m \in G_1 \cup G_2 \cup G_3$ such that $\sigma_m(\varepsilon_m) = 0$ for all $\varepsilon_m\}$ is the set of voters who vote for B independent of their evaluation of party A. Let Z_R be the set of voters who randomize for whom they vote in some way: $Z_R = \{(G_1 \cup G_2 \cup G_3) \backslash (Z_A \cup Z_B)\}$. Note that any voter using a threshold strategy is part of Z_R. However, this is not the only kind of randomization. For instance, a voter might flip a coin to decide who to support. Let the notation $|Z_A|$ indicate the number of voters who play the pure strategy of always voting for A.

In the following series of propositions we characterize the properties of Nash equilibria in the voting game.

Proposition 1: Unless either $|Z_A| - |Z_B| > |Z_R| + 1$ or $|Z_B| - |Z_A| > |Z_R| + 1$, all voters use threshold voting strategies.

Proof: Suppose, without loss of generality, that $|Z_A| \geq |Z_B|$. Since there are $3n$

total voters, $|Z_R| = 3n - |Z_A| - |Z_B|$. Therefore if $|Z_A| - |Z_B| > |Z_R| + 1$ then $|Z_A| > \frac{3n+1}{2}$. If any voter switches their vote then $|Z_A| \geq (3n+1)/2$ so no voter can unilaterally alter who wins: $W_A = W_B = 1$, so $OP = 0$, $BPrize_A = BPrize_B = 0$. Hence $U_m(VoteA) - U_m(VoteB) = (APrize_A - APrize_B)\Theta_A \geq 0$. In this case m need not use a threshold strategy (although she could if $APrize_A = APrize_B$).

Now suppose that $|Z_A| - |Z_B| = |Z_R| + 1$. Voters in Z_B and Z_R cannot unilaterally alter the outcome. However, consider the incentives of voter $m \in Z_A$. If she continues to vote A then A always wins the election because at most the Z_R voters generate $|Z_R|$ votes for B: $W_A = 1$. However, if m switches her vote to B and all voters in Z_R vote for B, which occurs with probability $\prod_{i \in Z_R}(1 - p_i)$, then B wins. Hence $W_B = 1 - \prod_{i \in Z_R}(1 - p_i)$. Therefore $OP = W_A - W_B = \prod_{i \in Z_R}(1 - p_i) > 0$. This contradicts $m \in Z_A$, since m uses a threshold strategy. Similarly, for all other values $|Z_A| - |Z_B| \leq |Z_R| + 1$, $W_A > W_B$ for all voters, which implies $OP > 0$ for all voters. This contradicts their using a pure voting strategy. QED.

Proposition 1 tells us that if party A is guaranteed to win by at least 2 votes then there are equilibrium strategies that might include voter m always voting for one party independent of her evaluation of the parties. All voters voting for party A is an interesting example of such an equilibrium which we explore in detail later. If, however, party A is not guaranteed a margin of victory of at least two votes, then in equilibrium all voters must be using threshold voting strategies. Voters using such strategies vote for A when their evaluation of party A, ε, is above a threshold level. It is important to note that while voters use these thresholds, they do not necessarily reflect their sincere evaluations of party A. That is, in general $\tau_m \neq -\alpha$. Proposition 1 suggests testable hypotheses regarding the behavior of voters with strong party identification. Voting based on party identification should be more prevalent in elections not expected to be close. When an election is expected to be very close, even strong party identification may not prevent split ticket voting or other manifestations of threshold voting.

Voters can only adopt pure voting strategies, that is support one of the parties whatever their evaluation of party A, if the outcome of the election is a foregone conclusion. The next proposition explores conditions under which members of different groups can support a party that is bound to lose the election. We examine possible equilibrium voting strategies within the groups under this contingency.

Proposition 2: If $|Z_A| - |Z_B| > |Z_R| + 1$ (i.e. party A is guaranteed to win the election), then in equilibrium voter m in group G_1 only always votes for B ($m \in Z_B$) if either $|Z_{A1}| + |Z_{R1}| + 1 < \max\{|Z_{A2}|, |Z_{A3}|\}$ (in which case $AprizeA = AprizeB = 0$) or $|Z_{A1}| > \max\{|Z_{A2}| + |Z_{R2}|, |Z_{A3}| + |Z_{R3}|\}$ (in which case $AprizeA = AprizeB = 1$).

Proof: Since $|Z_A| - |Z_B| > |Z_R| + 1$, A always wins the election so $OP = 0$ and $BPrize_A = BPrize_B = 0$. Thus, $U_m(VoteA) - U_m(VoteB) = (APrize_A - APrize_B)\Theta_A \geq 0$. If $APrize_A > APrize_B$ then m strictly prefers A to B. Hence m can only support the losing party B if $APrize_A = APrize_B$. This requires that either group G_1 could never win the prize from A even if voter m switched her voter, or that group G_1 always wins the prize from A despite m's lack of support. Group G_1 can never win the prize even if m switches her vote if $|Z_{A1}| + |Z_{R1}| + 1 < \max\{|Z_{A2}|, |Z_{A3}|\}$. If $|Z_{A1}| > \max\{|Z_{A2}| + |Z_{R2}|, |Z_{A3}| + |Z_{R3}|\}$ then group G_1 always wins the prize from A even without m's support. QED.

Proposition 2 tells us that a voter could only always support the losing party if her group had no chance of winning the prize from the winning party or if her group was certain to win the prize even without her support. The intuition can be seen by considering some simple examples with 3 voters in each of 3 groups with all voters using deterministic strategies. Let (3,3,3) indicate that each group produced 3 votes for A. This is an equilibrium: since $APrize_A = 1/3$ and $APrize_B = 0$, all voters strictly want to support A. Party A is certain of winning and each group has a one third chance of receiving the prize. If a voter switches her vote the electoral outcome does not change – A still wins – but her group no longer has any chance of getting the prize. In this case no one supports the losing party because doing so reduces their group's chance of getting the prize.

The voting distributions (1,3,3) and (0,3,3) are equilibria in which members of group G_1 support the losing party. Each of these voters can support B as part of an equilibrium because switching their vote would not alter the distribution of the contingent prize. However, the vote distribution (2,3,3) can not be an equilibrium. The voter supporting B in group G_1 can give her group a one third chance of obtaining the prize if she switches to voting for party A. In these examples we see that the addition of a contingent prize can produce a variety of vote distributions that are compatible with voter interests and yet also identifies vote distributions that are expected not to arise because they are incompatible with voter interests. The model allows for a rich and predictable array of degrees of electoral competitiveness and implies testable hypotheses about the variance in voter support and pork or patronage allocations across precincts within multi-precinct constituencies.

Fully Symmetric Equilibria

First we characterize equilibria in which all voters adopt the same voting strategy: $\sigma_i(\varepsilon) = \sigma_j(\varepsilon)$ for all i, j. Later we examine asymmetric equilibria in which voting strategies are symmetric within groups but asymmetric across group.

Always Support Party A There always exists a pure strategy equilibrium in which all voters choose A (or all choose B). As we have seen, the unanimous choice of one party ensures that each group has a 1/3 chance of receiving the prize. Should any voter support B then her group has no chance of receiving the prize. While no voter is outcome pivotal, they are all pivotal with respect to the prize from party A and so they all strictly want to support party A.

Interior Solutions There are also equilibria with interior solutions characterized by the threshold τ^*. Specifically,

$\tau^* = -\alpha - \frac{(APrize_A - APrize_B)\Theta_A + (BPrize_A - BPrize_B)\Theta_B}{(W_A - W_B)}$ and $p = F(-\tau^*)$. This is a fixed point. Given the threshold τ^* the probability that each voter supports A is $p = \Pr(\varepsilon_i \geq \tau^*) = 1 - F(\tau^*) = F(-\tau^*) = F(\alpha + \frac{(APrize_A - APrize_B)\Theta_A + (BPrize_A - BPrize_B)\Theta_B}{(W_A - W_B)})$. Given these vote choices by the other voters, voter m strictly supports party A if $\varepsilon_m > \tau^*$, strictly prefers B if $\varepsilon_m < \tau^*$ and so, voting according to the threshold voting rule is a best response.

Proposition 3: There are two types of fully symmetric equilibrium in the voting game. First, all voters can support party A (or party B). Second, there are equilibria defined by the threshold strategy τ^* where $\tau^* = -\alpha - \frac{(APrize_A - APrize_B)\Theta_A + (BPrize_A - BPrize_B)\Theta_B}{(W_A - W_B)}$ and $p = F(-\tau^*)$.

Proof: Since by symmetry all voters adopt the same strategy, either $|Z_A| = 3n$, $|Z_B| = 3n$ or all voters adopt threshold strategies. If all voters support A then $U_m(VoteA) - U_m(VoteB) = (APrize_A - APrize_B)\Theta_A = \Theta_A/3 > 0$. Therefore all voters strictly prefer to support A. Therefore, all voters supporting one party is always an equilibrium. Similarly if all voters support party B then $U_m(VoteA) - U_m(VoteB) = (BPrize_A - BPrize_B)\Theta_B = -\Theta_B/3 < 0$.[5]

[5]It is important to differentiate this equilibrium from a common pathology in voting equilibria. Nash equilibria require that no player can improve her payoff by switching her vote. The common pathology in voting is that even if everyone prefers outcome C to outcome D, a unanimous vote for D is a Nash equilibrium because for any individual, changing his or her vote does not alter the outcome. Therefore voting for D is a best response (see for instance McCarty and Meirowitz 2007, p.99, 138-140). To avoid these pathological cases, researchers typically focus on weakly undominated equilibria in which voters vote as if their decision matters, i.e. as if they are pivotal. Although it might be the case that $(\alpha + \varepsilon_i + \Theta_A) < 0$ for all voters, such that even in the best case scenario support for A means voting for the least preferred party, voting for A is strictly better than voting for B when the prize allocation rule is contingent and p is substantial. In the contingent prize context, *weakly undominated* has no bite.

Next consider the interior case. The existence of an interior equilibrium is best demonstrated graphically. First evaluate $Q(p) = U_m(VoteA) - U_m(VoteB)$ evaluated at $\varepsilon_m = -F^{-1}(p)$, where F^{-1} is the inverse function of F. $Q(p) = (W_A - W_B)(\alpha - F^{-1}(p)) + (APrize_A - APrize_B)\Theta_A + (BPrize_A - BPrize_B)\Theta_B$. The value $\varepsilon_m = -F^{-1}(p)$ is the threshold in a threshold voting strategy that is consistent with voting for party A with probability p. If $Q(p) = 0$ then when every other voter supports party A with probability p, voter m is indifferent between supporting A or B when her evaluation of A is $\varepsilon_m = -F^{-1}(p)$. In this scenario, voter m would also support party A with probability p, which is a fixed point. To show that an interior equilibrium exists we need to show that there exist some $p \in (0, 1)$, such that $Q(p) = 0$.

As shown above, as $p \to 1$ then $Q(p) \to \Theta_A/3$ and as $p \to 0$ then $Q(p) \to -\Theta_B/3$. For $p \in (0, 1)$, $(W_A - W_B)$, $(APrize_A - APrize_B)$, $(BPrize_A - BPrize_B)$ and $\varepsilon_m = -F^{-1}(p)$ are continuous in p. Hence, $Q(p)$ is continuous in p and goes from the limit $-\Theta_B/3 < 0$ to the limit $\Theta_A/3 > 0$ as p goes from 0 to 1. Therefore, $Q(p)$ must cut the x-axis and at this value of p, $Q(p) = 0$.

The existence of an interior equilibrium is only guaranteed if both parties use a contingent prize allocation rule. If, for example, $\Theta_B = 0$, then $Q(p) \to 0$ as $p \to 0$ so there need not be a value of p such that $Q(p) = 0$. QED.

Asymmetric Interior Equilibria

We now characterize equilibria in which members of a group use the same voting strategy but these strategies differ across groups.

Recall that pure strategy voting occurs only if the outcome of the election is a foregone conclusion. Then, with group symmetry and three voters, the possible equilibrium vote totals are permutations of (3,3,3), (0,3,3) and (0,0,3). Further, we have established that p_1, p_2, p_3 must either all be pure voting strategies or all must be threshold strategies given within group symmetry and propositions 1 and 2.

Figure 2 illustrates an equilibrium where each group differs in its likelihood of supporting party A. The figure plots the probability with which each group supports party A (p_1, p_2 and p_3) against the size of the prize offered by the parties ($\Theta_A = \Theta_B = \Theta$) for $\alpha = 0$ and $n = 3$. When the prize is small, all groups are equally likely to vote for party A. Once the prize is worth a little more than 1, competition to receive the prize causes the groups to polarize. Members of group G_1 disproportionately support party A, group G_3 disproportionately supports party B while the voters in group 2 generally decide the election since they are equally likely to vote for either party. Of course the assignment of group G_1 as the supporter of A is arbitrary and shuffling the labels does not change the incentives. Indeed this is what makes the endogenous polarization such an interesting phenomenon. Initially group G_1 need have no innate attachment to party A, as is the case shown in figure 4, however, once group G_1 is perceived to generally support party A all its members have an incentive to fulfill this expectation to advantage the group in its quest for the prize. Polarization is self enforcing.

Figure 2 about here

In the equilibrium shown in figure 2, the members of groups G_1 and G_3 seek the prizes offered by parties. Since these groups disproportionately support one party, its members know that should that party win they are highly likely to get the prize allocated by that party. Consider the incentives of a voter in group G_1 as the size of the prize becomes large such that p_1 is close to 1 and p_3 is close to zero. If party A wins then it is highly likely that the prize goes to G_1. Indeed the only likely eventuality in which G_1 does not get the prize from a victorious party A is when all the voters in G_2 support A. This occurs with probability $(p_2)^3 = 1/8$. In this case group G_2 get the prize half the time. A member of group G_1 might prefer party B on the basis of policy (i.e. $\varepsilon_m < 0$) and should this voter support party B she greatly enhances the chance that party B wins. However, by switching she greatly reduces the chance that her group obtains the prize. Indeed party A is only likely to win if all the voters in group G_1 support it, in which case A is likely to give the prize to group G_1. In the numeric example, by supporting party A, a member of group G_1 gets a payoff of about $(\alpha+\varepsilon)/2+\Theta_A 7/16$ (with $\alpha = 0$ in this example). If she switches to support B then her payoff is approximately $(\alpha + \varepsilon)/8$. Unless their evaluation of party A, ε, is less than approximately $-7\Theta_A/6$, group G_1 members support A. Parallel logic explains why G_3 members support party B. Thus, the voting model suggests the opportunity for there to be strong party identifiers based on expectations about contingent benefits allocations even if the identifiers do not actually like the policies of the party with which they identify.

Next consider the incentives for members of group G_2. These voters support party A and B based upon their policy evaluation of the party (ε) and therefore, in expectation, they are equally likely to vote for either party. Consider the incentives of m, a member of this group. This voter has a significant pivotal influence in altering who wins the election. Indeed she is outcome pivotal about half the time (when the other members of her group each vote for a different party). This provides m with considerable incentive to vote for her preferred party, particularly when the magnitude of ε is large. However, m is also interested in capturing the prize. If she knew both other members of her group had voted for A then she could get about a 50% chance of the prize for her group by also voting for A. Particularly when the prize is large, m would have considerable interest in voting against her policy interests to get the prize. However, since the members of G_2 generally split their support, it is equally likely that the other members of her group have coordinated on supporting B, in which case she would want to support B also. Since the prize-chasing-incentives cancel each other out, m votes on the basis of policy. Since members of group G_2 are unlikely to coordinate all their support on a single party, they are unlikely to be awarded the prize. Therefore their vote choices are predominantly motivated by policy concerns. For this reason, if the model is extended to allow for abstentions, then it is policy-driven members of group G_2 who abstain when they are relatively indifferent between the parties' policies. In contrast members of groups G_1 and G_3,not only want to pay the cost of voting, they often vote against their policy interests.There are other asymmetric equilibria.[6]

COORDINATION WITHIN GROUPS AND POLARIZATION ACROSS GROUPS

Before proceeding to the implications of these models, it is useful to delve into the incentives for group members to coordinate. Consider a representative voter m from group G_1. Suppose this voter believes that each member of G_2 will vote for party A with probability p_2 and G_3 members support A with probability p_3. Further, suppose m believes that the other voters in her group will vote for party A with probability p_1. Substituting these values into the expressions for W_A, W_B, $APrize_A$ etc enables us to find type, ε_m^*, of voter m who is indifferent between supporting A and B: $U_m(VoteA) - U_m(VoteB) = (W_A - W_B)(\alpha + \varepsilon_m^*) + (APrize_A - APrize_B)\Theta_A$ $+ (BPrize_A - BPrize_B)\Theta_B = 0$.

Figure 3 plots the probability with which voter m supports party A given her belief about voting behavior in the groups, p_1, p_2 and p_3. Figure 3 is constructed assuming $p_2 = .8$, $p_3 = .2$, $\alpha = 0$ and $n = 3$. The horizontal axis plots the probability with which the other members of group G_1 support party A (p_1). The vertical axis shows

[6]For instance, when $\Theta_A = \Theta_B = 2$ and $\alpha = 2$ there is an equilibrium where members of two of the groups virtually always support party A and members of the third group supports A 62% of the time and another equilibrium in which each member of one group supports A 99% of the time and each member of the other groups supports A around 49% of the time. Thus, depending on specific conditions, the model is capable of producing a wide variety of vote distributions as parts of equilibrium strategies.

the probability with which m supports party A given her beliefs, that is to say, the black line shows $F(-\varepsilon_m^*)$ as a function of p_1.

Figure 3 about here

The figure provides a partial equilibrium analysis in the sense that given expectations about p_2 and p_3, equilibrium voting behavior within group G_1 is characterized by the points at which $F(-\varepsilon_m^*)$, the solid black line, cuts the 45 degree line. In particular, given p_2 and p_3, members of group G_1 are playing best responses if they each vote for A with probability 0.99; if they each vote for A with probability 0.01 or if they each vote for party A 50% of the time.

Although figure 3 is a specific example it illustrates many general themes. Group members endogenously coordinate their voting. If the other members of the group are likely to support A, then voter m is incentivized to vote for A. Once group G_1 is identified with party A, each of the members of G_1 individually wants to reinforce these expectations and support G_1. Contingent prize allocation rules encourage this endogenous polarization which effectively converts group G_1 from n separate voters making separate voting decisions to a bloc of votes. Yet, there is no coercion. Each individual in the group wants to coordinate with the bloc voting decision.

The size of the contingent prizes shape the degree of endogenous polarization. When prizes are small then the incentive of the group to coordinate is relatively low. The curve in figure 3 ($F(-\varepsilon_m^*)$), although always increasing, is relatively flat around its extremes. As the size of the prize grows then the incentives to coordinate increase and the function $F(-\varepsilon_m^*)$ becomes much steeper in the middle and the group forms a more cohesive voting bloc. Eventually, as the size of the prize continues to increase the curve $F(-\varepsilon_m^*)$ resembles a step function. The presence of contingent prizes encourages the formation of voting blocs and the greater the size of the prizes the tighter these voting blocs are likely to be.

Contingent prize allocation rules provides a rival explanation to the socialization phenomenon observed by Sprague and Huckfeldt (1995) via which neighbors tend to vote the same way. There is socialization in the sense that voters learn the voting proclivities of their neighbors, but the response to this information is a rational co-ordination of voting rather than an adoption of the neighbors' values. One potential means to distinguish between these competing ideas is to examine the voting behavior as people move in and out of the group (or electoral precinct). Migration offers one useful example. People who move into a neighborhood just prior to an election probably do not have time to become socialized to their neighbors' values but perhaps they have time to learn how their new neighbors are likely to vote. For instance, a neighborhood of lawn signs for a particular candidate allow the new immigrant to quickly assess the neighborhood's affiliation even if she does not have time to be socialized to the values that might underlie such support. The political socialization and the rational response to coordinate differ in the time scale they take to act.

Redistricting also offers an opportunity observe ..... GET JAS PAPER.

Turnout

As we noted at the outset, a major critique of the rational voting literature has been to question why people vote given that the individual voter's chance of influencing the electoral outcome is vanishingly small as the size of the electorate grows. The contingent prize model offers an explanation as to why voters turnout even when their vote is unlikely to alter who wins. What is more, it identifies which groups of voters are most likely to vote. The shaded area in figure 3 assesses the probability that a voter will abstain when voting is costly.

Thus far we have treated voting as costless and assumed full turnout. However, suppose voting is costly. In the case shown in figure 3, the cost of voting is $c = .4$. Generalizing from the model and assuming any ties are split by a coin flip, we can calculate m's payoff from supporting A or B using the formulae derived above minus the cost of voting. We can also derive the expected payoff from abstaining. The height of the shaded area in figure 3 indicates the probability with which m abstains. Obviously as the cost of voting (c) increases, m is more likely to abstain. More interestingly, the analysis shows that m is more likely to abstain when her group is indecisive with respect to which party it supports. When most members of group G_1 will vote for party A (the right hand side of figure 3), m strongly supports A and is unlikely to abstain. However, when group G_1's support for A is more fickle (in the middle of figure 3), voter m has less incentive to turnout, as evidenced by the greater height of the shaded area in figure 3 when p is around 0.5. When group G_1 is not strongly affiliated with one party, this group has a relatively low chance of winning the prize, so its members make their electoral choice based on their evaluation of the party. When m is relatively indifferent between the two parties in terms of policy evaluation ($\alpha + \varepsilon_m \approx 0$), m has little incentive to pay the cost of voting unless the election is likely to be close.

The extent to which pivotalness affects turnout depends upon group membership. Turnout is high in groups which strongly identify with one party. Further turnout in such groups is relatively insensitive to the closeness of the race since members of such groups are motivated by the competition for prizes and not a desire to alter the outcome of the election. Party machines, such as Tammany's New York, generate high turnout from their core constituencies even in relatively uncontested elections (Allen 1993; Myers 1971). The voters in these core democratic neighborhoods are not voting to alter the outcome of the election, but rather they want to win prizes (pork) from their party. In contrast, in groups which are not strongly affiliated with a particular party, turnout is likely to be lower and more dependent upon the closeness of the race. Voters in such groups have little prospect of capturing the prize and so vote only to influence the electoral outcome. Consequently, they are more likely to turnout when the election is expected to be close. The empirical literature shows turnout is higher in close elections. The model suggests that the elasticity between turnout and closeness is greater in competitive precincts than in precincts which predominantly support one party.

Incumbency and Policy Choice

Contingent prize allocation rules allow hegemonic parties to remain dominant even when they are widely recognized as offering inferior benefits relative to other parties. Magaloni (2006), for example, documents the persistence of the dominant PRI party in Mexico after it had been thoroughly discredited. The model provides an explanation for such persistence. It also explains the policy choices of different parties.

If a hegemonic party relies predominantly on contingently allocated prizes, then it incentivizes voters to support it. As shown above, everyone voting for a single party is an equilibrium. It is also a very robust outcome. While no one is pivotal in terms of altering the electoral outcome, everyone is pivotal in terms of the prize allocation. If everyone votes for party A then each voter's payoff from supporting A is $\Theta_A/3$. However, if a voter supports party B or abstains then her group generates one fewer votes for A and so her group has no chance of winning the prize. This equilibrium persists even when everyone recognizes that they would be better off under an alternative government. Suppose that for all voters $\alpha + \varepsilon_i + \Theta_A < 0$, such that even under the best case scenario every voter prefers party B to party A. It is still the case that A can win. A contingent prize allocation rule makes it hard for reformers to win, even if every voter recognizes that the reformer has the best policies and will produce the most benefits. The reformer's electoral problem is that while every voter might want the reformer to win, each voter wants the reformer to win with someone else's votes.[7]

[7] Feddersen et al (2009) offer an alternative analysis. They argue and offer experimental evidence that as (outcome) pivot probabilities become small voters pick the morally superior outcome, which

Consider for a moment the Pakistani election of 1997 in which Imran Khan, one of Pakistan's most successful and distinguished all round cricketers, launched the Pakistan Tehreek-e-Insaf (PTI) party against the entrenched patronage parties, Pakistan Peoples Party (PPP) and Pakistan Muslim League (PML-N). Khan, who had huge popularity and name recognition given his career as Pakistan's cricket captain, ran his party on the platform of cleaning up corruption. Although he admitted he had little political experience, he also said "but then neither have I any experience in loot and plunder" (New York Times April 26, 1996). Despite the recognition of the need for reform, Khan was the only member of his party to win a seat. The PML-N party won the election by a landslide and engaged in corruption until being deposed by a military coup in October 1999.

Pivot patronage offers an explanation as to why the voters turned their backs on a reformist party in favor of continued corruption and patronage. Suppose for a moment we assume that Khan could and would have implemented reformist policies. Under this assumption PTI would have been better than the mainstream alternatives, PPP and PML-N, for the vast majority of Pakistanis. Yet, Khan's problem was that even if all the voters want him in office they want him elected on other people's votes. Since the PTI party ran on a platform of honest public goods provision, the benefits accrued to people whether they voted for it or not. This is not the case with a patronage or pork-oriented party. Unless the voters were certain the PML-N would lose and hence could not reward their most supportive groups, voters want to vote for the PML-N to enhance their prospects of receiving the prizes that it offered. Reformist parties have real problems challenging entrenched patronage parties. Everyone might want them to succeed but everyone also wants someone else to vote the reformist into power.

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in this context would be the reformer. In their experiments voters vote against their individual material well-being as the electorate gets large. However, their experiments only examine non-contingent prize allocation rules.

The model not only explains why Imran Khan's reformist party was unsuccessful, it also explains why Khan pursued a reformist agenda while the incumbents persist in their policies of handing out prizes. Suppose party A contemplates increasing the benefits it offers. It might for instance improve the quality of its public goods provision or reduce taxes. Such policy shifts improve welfare for all citizens and so can be operationalized as an increase in α. Alternatively, A might off a non-contingent prize θ if it is elected. Finally party A might increase the size of the prize it offers; that is, increase Θ_A. By comparing the voters' incentives to vote for A rather than B we can calculate the marginal value of each of these policy changes. Modifying equation 4 to incorporate θ, voter m supports A rather than B if $(\alpha+\varepsilon_m^*)+\theta+\frac{(APrize_A-APrize_B)}{(W_A-W_B)}\Theta_A + \frac{(BPrize_A-BPrize_B)}{(W_A-W_B)}\Theta_B > 0$. The marginal returns to increased public goods and increased non-contingent prizes are 1. In contrast, the marginal return to an increase in the size of the contingent prize is $\frac{(APrize_A-APrize_B)}{(W_A-W_B)} = \frac{PP_A}{OP}$. That is the marginal return to increased contingent prizes is the ratio of the prize pivotalness to outcome pivotalness. As can be seen in figure 1, when p is low and voters are unlikely to support party A, this ratio is relatively low.[8] In contrast as p increases then the ratio becomes very large. A party's electoral prospects determine which policies are most likely to garner it electoral support.

Established incumbent parties promote contingent prizes at the expense of increased public goods. In contrast, non-incumbent parties are reformist and promote public goods. Figure 4 revises figure 3. The solid black line is identical to the line in figure 3 and shows $F(-\varepsilon_m^*)$, the probability that voter m from group G_1 supports party A, as a function of how the other members of her group are likely to vote (p_1). The dotted line recalculates $m's$ vote choice if party A increases the size of its contingent prize reward, Θ_A, by one unit. The dashed line shows the effects of

[8] In an earlier paper (Bueno de Mesquita and Smith 2009), we proved that in the fully symmetric case ($p_1 = p_2 = p_3 = p$) that $\frac{(APrize_A-APrize_B)}{(W_A-W_B)} > 1/3$ for all p for all $n \leq 99$.

increasing α or θ by one unit. Such a shift might reflect an improvement in public goods provisions. Both these policy improvements increase the desirability of party A; both lines are shifted up relative to the black line. However, the change in vote probability for party A from these policy changes depends upon the level of party affiliation by the group. When group G_1 is likely to vote for party A (RHS of figure 4) then increasing the size of the prize improve A's electoral chances more than an increase in public goods. The reverse is true when group G_1 is unlikely to support party A (low p_1, LHS of figure 4).

Figure 4 about here

The dot-dash line in figure 4 considers the trade-off between prizes and public goods. It shows that the likelihood that voter m supports party A changes as A increases its contingent prize Θ_A but at the expense of decreasing public goods (α). When group G_1 is likely to support party A, such a shift enhances A electoral prospects. Yet, when A is unlikely to garner the support of group G_1, such a shift away from public goods towards more prizes diminishes A's vote share in group G_1. New political parties focus on the provision of public goods while incumbent parties promote prizes at the expense of public goods provisions. In light of these predictions, it is small wonder why the Tammany leader George Washington Plunket ran around New York offering clothing, comfort and shelter to fire victims in strongly democratic neighborhoods rather than implementing the building and fire code standards that would prevent fires in the first place (Allen 1993, Ch. 6; Riordon 1995).

Credibility and Contingent Prizes

Before concluding we contrast the contingent prize setup with traditional patronage arguments. In standard patronage arguments, party or machine candidates offer individual voters rewards in exchange for their vote. Such a mechanism is plagued with credibility problems (Stokes 2007). If the reward is paid out in anticipation of the vote, the party or candidate cannot be confident that the voter will actually vote the agreed way. If the vote is secret, the party or candidate cannot know whether the voter-beneficiary lived up to his or her part of the bargain. If the personal benefit is promised for delivery after the election then the voter cannot be confident that the candidate or party, once elected, will pay out the benefit rather than pocketing them. So, neither the voter nor the candidate or party can credibly commit to the patronge for votes deal.

The patronage mechanism is further complicated because parties do not hand out enough prizes to reward all their supporters. Evidence from Argentina suggests that the pivotal patronage account is more compelling than the traditional quid pro quo explanation. Brusco, Nazareno and Stokes (2004) examined whether people who received gifts from a party feel compelled to vote for it. They found that few respondents to their survey felt such an obligation, although many people felt that it was likely that recipients would have had a sense of obligation. Consistent with these results, Guterbock (1980) found that in Chicago those who received party service were no more likely to vote Democratic.

Scholars have considered a variety of solutions to the issue of credibility in direct exchange models of patronage. For instance, Robinson and Verdier (2002) propose an economic explanation. They assume parties are better able to extract rents from some groups compared to others which de facto ties the fates of particular workers to particular parties. Other approaches look at reputation. For instance, drawing on the literature on cooperation in the repeated prisoners' dilemma setting, Stokes (2005) invokes a trigger punishment system to explain why parties deliver rewards and voters support them. If a party fails to deliver rewards then voters don't support it in the future, and if voters take bribes but fail to support the party then they never receive bribes in the future. This punishment mechanism requires the party to know how individuals vote, which could explain why patronage works best in tight-knit communities.

While reputational arguments grounded in individual quid-pro-quo deals between parties and voters provide a means to maintain credibility, they suffer from several limitations. Trigger punishment strategies may lack credibility when candidates or parties cannot observe whether the voters with whom they made quid-pro-quo deals actually reneged or not. Likewise, voters may not be able to verify whether the parties fulfilled their promises since deals with individual voters or local entrepreneurs are not likely to have great transparency. Indeed, the evidence suggests that typically only a small proportion of voters directly benefit from patronage rewards and yet parties need to induce broad support (Guterbock 1980, ch1). Further, as discussed above, surveys suggest that the receipt of rewards seems only to have a weak impact on an individual's vote choice.

Pivotal patronage arguments do not suffer from these credibility issues. The mechanism does not rely on the credibility of the individual voter's commitment nor on the party's ability to monitor the individual voters. Voters support the party, not in response to past gifts, but in the hope of winning the prize for their group in the form of pork; that is, local public goods. Only a few voters or blocs need to receive rewards in order to stimulate competition for the scarce prizes in the future.

The only significant credibility issue in the pivotal patronage system is whether parties can commit to allocate prizes after they are elected. This is readily resolved by an argument that relies on verifiable, discernible vote-shares by precinct/group (Bueno de Mesquita and Smith 2009). Provided that the party cares about its electoral future it hands out prizes.

There is considerable disagreement in the patronage and voting literatures as to whether parties reward core supporters or swing voters (Cox and McCubbins 1986; Dixit and Londregan 1996; Hicken 2007; McGillivray 2004;Persson and Tabellini 2000; Stokes 2005). When viewed from the pivotal patronage perspective these differences do not seem so irreconcilable. Our model considered a single electoral district with multiple precincts. Suppose we extend the model such that a party needs to carry two of three electoral districts to win and each district is composed of three precincts. If these districts differ in marginality then we conjecture that the party's best strategy is to offer a large prize for the most supportive precinct in the marginal district. Such a strategy maximizes the party's chance of securing the support of voters in the marginal district which is key for victory. When related back to the debate about core supports versus swing voters, the party is doing both. It gives the largest prize to the swing district, but within that district it rewards those who support it.

CONCLUSION

Pivotal patronage with a contingent prize allocation rule explains how parties can incentivize voters to support them by offering to reward those groups which provide the greatest level of political support. Given such an incentive scheme, the voters support the party, not because they like its policies, but because they want to win the prize for their group. Voters can be pivotal in two senses. They can determine the outcome of the election – outcome pivotal–and they can alter the distribution of political rewards–prize pivotal. In large electorates, each voter's influence on the outcome of the election is miniscule. But not so with regard to the allocation of the prize. Given that the prize incentive dominates the incentive to influence which party wins, voters will vote for parties whose policies harm their welfare. Further the desire to win the prize motivates people to vote even though who will win the election is a forgone conclusion.

Pivotal patronage works when parties observe the electoral support of groups and target rewards to those groups that are most supportive. We have focused on geographical precincts because this is a common way in which voters are partitioned into groups. Yet, in the theory there is nothing special about this partition. All that really matters is that parties observe votes by groups and can target rewards to those groups. The pivotal patronage system fails if the technology of policy provision makes it difficult to target rewards to groups. The increasing complexity and scale of public policy projects has led to increasing professionalization and the requirement of talented and trained civil servants rather than just party loyalists. These technological changes can constrain the ability of parties to target rewards to certain groups although pork barrel legislation is a means for elected officials to circumvent the old patronage system through appointment to jobs. That is, the prevalence and nature of patronage changes as the types of goods and services that government provides changes.

Voting technology also affects whether patronage can flourish or not. The Australian, or secret ballot, limits the extent to which parties can directly exchange favors for votes. Pivotal patronage can also be restricted by voting technology. The contingent prize allocation rule incentivizes voters to support a patronage party in the hope of winning a prize for their group. Chandra (2004), Hale (2007) and Levitsky (2007) all report that parties use the counting of votes at subdistrict level to measure electoral support. In the context of geographical grouping, pivotal patronage is eliminated if votes are counted at the district level and not the precinct level. If the ballot boxes from all precincts are taken to a central district level office and votes from all the precincts are counted together, then the contingent prize allocation rule can not be used. This suggests both an experiment to test the pivotal patronage argument and a public policy fix (albeit one that may contradict both the interests of politicians and of many voters). If the votes were aggregated at a larger district in some randomly chosen cities or provinces in a patronage prone nation, then we should expect differences in the policies and politics between areas where vote totals are disaggregated and places where they are not.

REFERENCES

Allen, Oliver E. 1993. The Tiger: The Rise and Fall of Tammany Hall. Reading MA: Addison-Wesley Publishing Company.

Barndt, William, Philip Bond, John Gerring, and Carola Moreno. 2005. "Democracy and Economic Growth: A Historical Perspective." World Politics 57(3): 323-64.

Barzel, Yoram and Eugene Silberberg. 1973. Is the Act of Voting Rational?. Public Choice 16:51-60.

BBC. 2005. What lies behind the Zimbabwe demolitions? July 26 2005. http://news.bbc.co.uk/2/hi/africa/4101228.stm

Berelson, Bernard R., Paul F. Lazaersfeld and William N. McPhee. 1954. Voting: A Study of Opinion Formation in a Presidenital Campaign. Chicago: Univeristy of Chicago Press.

Brusco,V., M. Nazareno and S. Stokes. 2004.Vote Buying In Argentina. Latin American Research Review 39(2):66-88.

Calvo, Ernesto, and Maria Victoria Murillo. 2004. "Who Delivers? Partisan Clients in the Argentine Electoral Market." American Journal of Political Science (October): 742–57.

Chandra, Kanchan. 2004. Why Ethnic Parties Succeed. Cambridge: Cambridge University Press.

Chhibber, Pradeep K. 2001. Democracies without Associations. Ann Arbor: University of Michigan Press.

Chubb, Judith. 1982. Patronage, Power, and Poverty in Southern Italy. New York: Cambridge University Press.

Cox, GaryW., andMatthew D. McCubbins. 1986. "Electoral Politics as a Redistributive Game." Journal of Politics 48 (May): 370–89.

Democratic Party Headquarters. 2007. "Call for the 2008 Democratic National

Convention." February 2, 2007. Washington DC: Democratic Party Headquarters

Dixit, Avinash, and John Londregan. 1996. "The Determinants of Success of Special Interests in Redistributive Politics." Journal of Politics 58 (November): 1132–55.

Downs, Anthony. 1957. An Economic Theory of Democracy. New York: Harper and Row Publishers.

Feddersen, Timothy, Sean Gailmard and Alvaro Sandroni. 2009. Moral Bias in Large Elections: Theory and Experimental Evidence. American Political Science Review 103(2): 175-192.

Geys, Benny. 2006. 'Rational' Theories of Voter Turnout: A Review. Political Studies Review 4:16-35.

Gibbons, Robert. 1996. "Incentives and Careers in Organizations." Working Paper no. 5705. Cambridge, MA: National Bureau of Economic Research.

Greene, Donald and Ian Shapiro. 1996. Pathologies of Rational Choice Theory: A Critique of Applications in Political Science. New Haven CT: Yale University Press.

Guterbock, Thomas M. 1980. Machine Politics in Transition: Party and Community in Chicago. Chicago and London: University of Chicago Press.

Hale, Henry E. 2007. Correlates of Clientelism. P227-250 in Patrons, Client and Policies: Patterns of Democratic Accountability and Political Competition. Edited by Herbert Kitschelt and Steven I. Wilkinson. Cambridge: Cambridge University Press.

Hicken, A. 2007. How do rules and institutions encourage vote buying? p68-89 in Elections for sale: The Causes and Consequences of Vote Buying, ed F. C. Schaffer. Boulder CO: Lynne Rienner.

Huckfeldt, Robert and John Sprague. 1995. Citizens, Politics and Social Communication: Information and Influence in an Election Campaign. New York: Cambridge University Press.

Keefer, Philip. 2007. "Clientelism, Credibility and the Policy Choices of Young Democracies," American Journal of Political Science 51: 804–21.

Lazear, Edward. 1995. Personnel Economics. Cambridge, MA: MIT Press.

Lazear, Edward, and Rosen, Sherwin. "Rank-Order Tournaments as Optimum Labor Contracts." Journal of Political Economy 89 (October 1981): 841–64.

Kitschelt, Herbert and Steven I. Wilkinson (ed). 2007. Patrons, Client and Policies: Patterns of Democratic Accountability and Political Competition. Cambridge: Cambridge University Press.

Levitsky, Steven. 2007. From Populism to Clientelism? P. 206-226. in Patrons, Client and Policies: Patterns of Democratic Accountability and Political Competition. Edited by Herbert Kitschelt and Steven I. Wilkinson. Cambridge: Cambridge University Press.

Magaloni, Beatriz. 2006. Voting for Autocracy: Hegemonic Party Survival and its Demise in Mexico. Cambridge University Press

McCarty, Nolan and Adam Meirowitz. 2007. Political Game Theory: An Introduction. Cambridge: Cambridge University Press.

McCarty, Nolan M., Keith T. Poole and Howard Rosenthal. 2006. Polarized America: The Dance of Ideology and Unequal Riches. Cambridge, MA: MIT Press.

Medina, L., and S. Stokes. 2007 "Monopoly and Monitoring: an Approach to Political Clientelism," in Patrons, Client and Policies: Patterns of Democratic Accountability and Political Competition. Edited by Herbert Kitschelt and Steven I. Wilkinson. Cambridge: Cambridge University Press.

Malloy, James M. & Mitchell A. Seligson, eds. 1987. Authoritarians and Democrats: Regime Transition in Latin America. Pittsburgh: University of Pittsburgh Press.

McGillivray, Fiona. 2004. Privileging Industry: The Comparative Politics of Trade and Industrial Policy. Princeton NJ: Princeton University Press.

Morton, Rebecca B. 1991. Groups in Rational Turnout Models. American Journal of Political Science, 35(3): 758-776.

Mushkat, Jerome. 1971. Tammany: The Evolution of a Political Machine 1789-1865. Syracuse:Syracuse University Press.

Myers, Gustavus. 1971. The History of Tammany Hall. New York: Dover Publications.

Padro-i-Miquel, Gerard. 2004. "Political Accountability in Divided Societies: The Politics of Fear." Dept. of Economics, MIT.

Park, Richard L. and Bruce Bueno de Mesquita. 1979. India's Political System, 2nd edition. Englewood Cliffs, NJ: Prentice Hall.

Persson, Torsten, and Guido Tabellini. 2000. Political Economics: Explaining Public Policy. Cambridge, MA: MIT Press.

Prendergast, Canice. "What Happens within Firms? A Survey of Empirical Evidence on Compensation Policies." Working Paper no. 5802. Cambridge, MA: National Bureau of Economic Research, 1996.

Republican National Convention 2008. The Rules of the Republican Party. Republican National Convention, Minneapolis- St Pauls MN: September 1, 2008.

Riker, William H. and Peter O. Ordeshook. 1968. A Theory of the Calculus of Voting. American Political Science Review 62: 25-42.

Riordon, William L. 1995. Plunkitt of Tammany Hall: A Series of Very Plain Talks on Very Practical Politics. New York: Signet Classics.

Robinson, James, and Thierry Verdier. 2002. "The Political Economy of Clientelism." CEPR Working Paper No. 3205.

Rosen, Sherwin. "Prizes and Incentives in Elimination Tournaments." American Economic Review 76 (September 1986): 701–15.

Schwartz, Thomas. 1987. Your Vote Counts on Account of the Way It Is Counted: An Institutional Solution to the Paradox of Not Voting. Public Choice, 54(2): 101-

121.

Scott, James C. 1969. "Corruption, Machine Politics, and Political Change." American Political Science Review 63(4): 1142–58.

Shachar, Ron and Barry Nalebuff. 1999. Follow the Leader: Theory and Evidence on Political Participation. American Economic Review 89(3): 525-547.

Stokes, Susan C. 2007. Political Clientelism. In The Oxford Handbook of Comparative Politics. Edited by Carles Boix and Susan C. Stokes. Oxford, UK: Oxford University Press.

Stokes, Susan C. 2005. Perverse Accountability: A Formal Model of Machine Politics with Evidence from Argentina. American Political Science Review 99(3): 315-325.

Tam,Waikeung. 2003. Clientelist Politics in Singapore: Selective Provision of Housing Services as an Electoral Mobilization Strategy. University of Chicago. Typescript.

Tullock, Gordon. 1967. Towards a Mathematics of Politics. Ann Arbor: Univeristy of Michigan Press.

Wilson, James Q., and Edward Banfield. 1963. City Politics. Cambridge, MA: Harvard University Press.

Figure 1: Outcome Pivots and Prize Pivots for n=3 and n=33

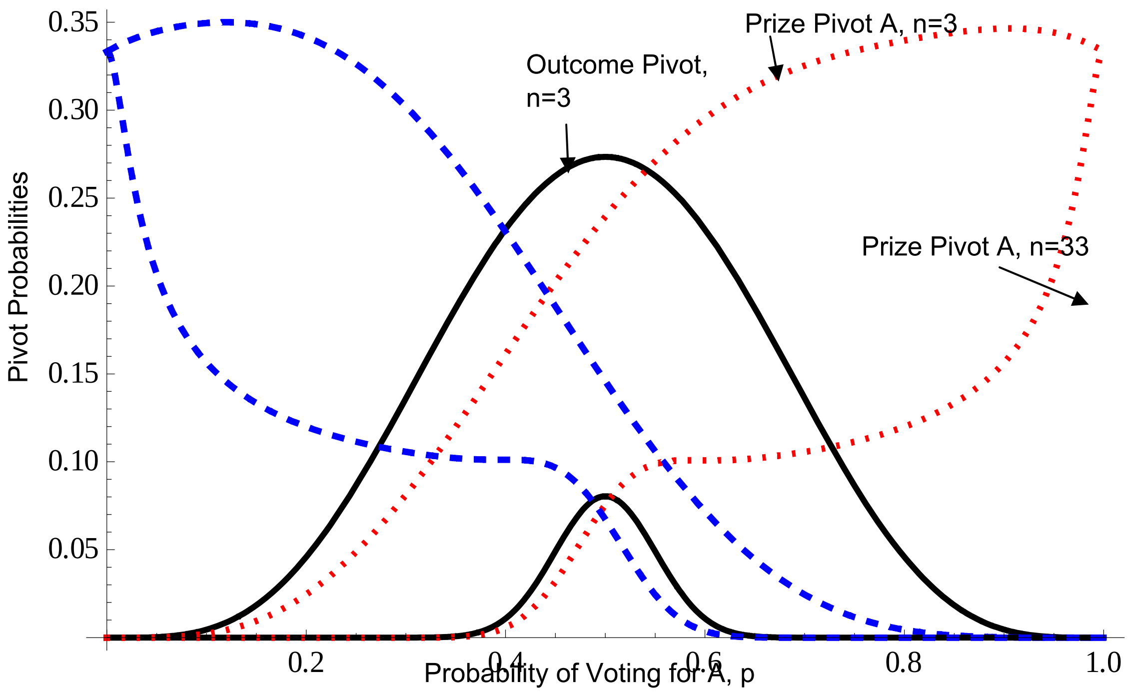
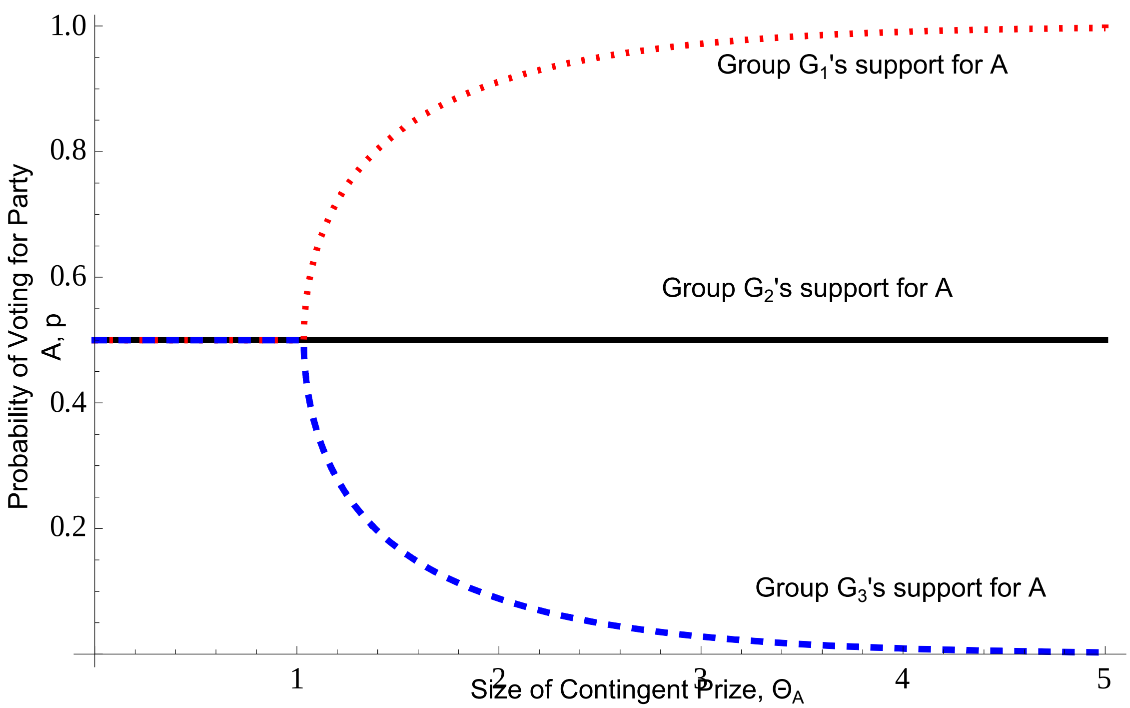


Figure 2: Asymmetric Equilibria and Prize Size



Size of Contingent Prize, Θ_A

Figure 3: Within Group Incentives to Coordinate Votes

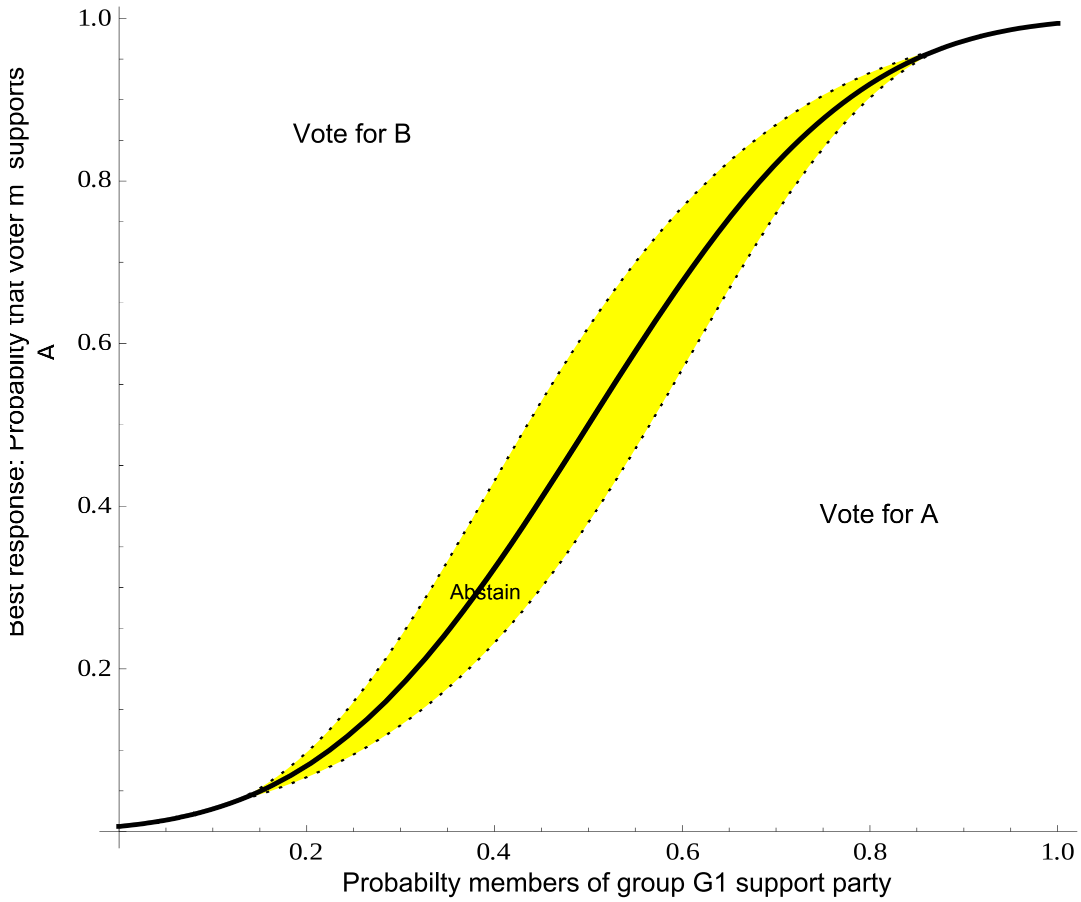


Figure 4: Policy Choice and Electoral Support