Appendix C

Signaling Model of Declared Support

This model examines the conditions under which declared support signals that a citizen's promise to vote for a politician is credible. In this way, declared support helps to sustain relational clientelism in contexts where the politician cannot observe citizens' vote choices and does not know citizens' underlying preferences. This game examines the subset of citizens in a district who meet two conditions: (1) they promise to vote for politician *P* in an upcoming election in exchange for future benefits if *P* wins, and (2) their vote choices and preferences are not perfectly known by *P* (i.e., there is incomplete information).

Given incomplete information, the politician is uncertain whether a citizen who promises a vote will actually fulfill that promise. To simplify the analysis, I assume that two types of citizens promise to vote for *P* in exchange for future benefits: *supporting promisers* and *opposing promisers*. Supporting promisers prefer to vote for *P* in the upcoming election, whereas opposing promisers prefer to vote against *P* in the election.

For the subset of the population under analysis, the politician cannot observe whether a promiser prefers to vote for her. And with effective ballot secrecy, she cannot monitor voting decisions. The politican observes, however, whether the citizen declares support for her during the campaign. A citizen declares support during the campaign by displaying political paraphernalia on his home, on his body, or at a rally. After the declaration action, the citizen votes according to his type, and then nature decides the election winner. If elected, the politician then decides whether to deliver benefits to the citizen.

The following formal analysis examines the separating conditions under which declared support serves as an informational signal distinguishing between citizen types. As such, it reveals how declared support can be a mechanism to facilitate relational clientelism in contexts in which citizens have asymmetric information. It is not guaranteed that such conditions will

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exist in every political context. A fuller characterization of the model would examine pooling conditions, under which both citizen types declare or do not declare.[1] It would also examine possible conditions under which equilibria are nonexistent.

Timing of the Game

- Nature chooses if citizen is a supporting or opposing promiser, $x \in \{s, n\}$.
- Citizen chooses whether to declare for politician, $d \in \{d, nd\}$.
- Citizen votes according to his type.
- Nature chooses the election outcome.
- If elected, politician chooses whether to provide benefits to citizen, $r \in \{0, r\}$.
- Utilities are allocated.

The signaling game is examined under the assumption that a citizen prefers to vote for or against P strictly due to expressive utility from the act of voting. Furthermore, to simplify the analysis, it is assumed the citizen does not influence the election outcome.

Model Parameters

Citizen

$x_t \in (-\infty, \infty)$: expressive utility gain/loss from voting for politician P
$d(x_t) \in (-\infty, \infty)$: expressive utility gain/loss from declaring for P. The function d is assumed to be a positive monotonic transformation of x_t (i.e., if $x > y$, then $d(x) > d(y)$)
$r \geq 0$: reward for declaring for P, when P wins election
$z \geq 0$: punishment for declaring for P, when P loses election
$c \geq 0$: material cost of declaring

Politician

$p \in [0, 1]$: probability P wins election
$v \geq 0$: utility to politician of a citizen's vote (0 if does not vote for P)
$f \geq 0$: utility to politician of a citizen's future votes (net of any future costs). 0 if citizen does not provide future votes to P

Citizen Utility

The citizen receives an expressive utility gain/loss of x_t from voting for politician P. This assumption – that voting provides only expressive utility, not utility from the possibility of influencing the election outcome – follows other models of clientelism such as Stokes (2005), Nichter (2008), Morgan and Vardy (2012), and Gans-Morse, Mazzuca, and Nichter (2014).[2]

[1] A previous version of this model examined pooling conditions.
[2] See Morgan and Vardy (2012) for a formal defense of the use of expressive utility.

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The citizen receives r if P provides her a reward, which is assumed to be a possible action only if P wins the election. P's probability of winning is p, which is not influenced by the citizen's voting or declaration decision.

If the citizen declares for P during the campaign, he also receives expressive utility $d(x_t)$, which is assumed to be a positive monotonic transformation of x_t – that is, if he obtains expressive (dis)utility from voting for P, he also obtains expressive (dis)utility from declaring for P, respectively. If he declares, the citizen also incurs a direct material cost of c.

By assumption, supporting promisers (citizen type S) prefer to vote for P in the election, whereas opposing promisers (citizen type N) prefer that P loses. Given that the model assumes voting only provides expressive utility, this implies that $x_s \geq 0$ and $x_n < 0$. Therefore, it follows that $x_s > x_n$.

If elected, the opposition candidate is assumed to impose a punishment of z if a citizen declared for P during the campaign. This punishment is realized only if P loses, so the probability is $1 - p$.

Politician Utility

Politician P receives utility v if the citizen votes for her and 0 otherwise. P incurs cost r if she wins and she decides to provide a reward to the citizen. The politician also receives utility $f \geq 0$ from future votes in subsequent elections not analyzed in this game. Under the shroud of ballot secrecy, a promiser who opposes P will never vote for P, so $v = 0$ and $f = 0$. On the other hand, if P follows through with her promise to provide benefits once elected, a supporting promiser may once again promise to provide votes in a subsequent election. But if P defects once elected, then the citizen is assumed not to commit to provide votes in subsequent elections.[3] For simplification, I assume that the politician prefers to continue to receive the promiser's votes in the future, which implies $f \geq r$. This assumption is similar to that in Stokes (2005), who assumes one-sided uncertainty in which citizens but not machines can defect. Such credible commitment by the politician can be derived as the cooperative equilibrium of a repeated game involving a grim trigger strategy by citizens. With this grim trigger strategy, citizens never vote again for a politician who defects on providing promised benefits. Chapter 6 more extensively examines the issue of politician credibility and how citizens respond to defecting politicians.

Separating Equilibria

The section examines conditions necessary for a separating equilibrium, in which declaring provides meaningful information about whether a citizen is a supporting promiser. In a separating equilibrium, voter types undertake different actions: the supporting promiser declares support and the opposing

[3] Recall that P never rewards if she loses, so in this case a lack of rewards does not affect the citizen's subsequent actions.

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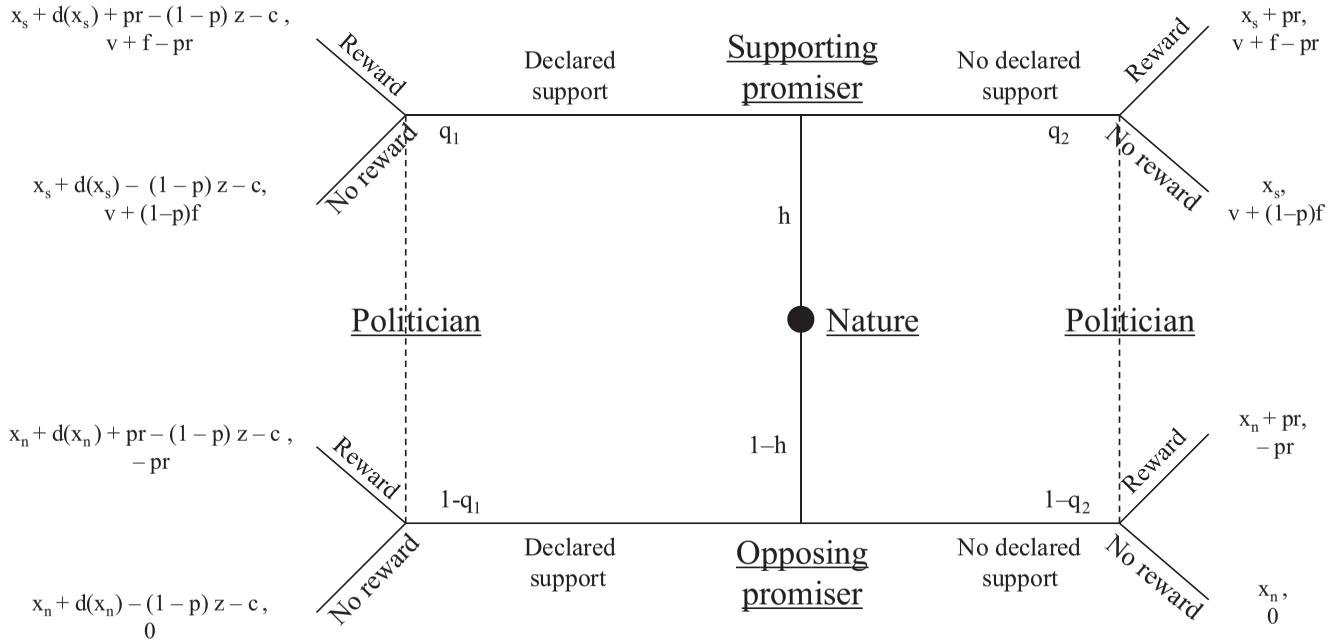

Top payoff: citizen's utility,
Bottom payoff: politician's utility

FIGURE C.1 *Signaling credibility through declared support*

promiser does not declare support. The politician's updated beliefs are $q_1 = 1$ and $q_2 = 0$, so he has complete information when she decides whether to provide a reward to the citizen (i.e., the fifth bullet in the game's timing).

Examining the bottom right half of the game tree, P's best response is not to reward if she does not observe declaration, because $0 > -pr$. Turning to the top left of the game tree, if the politician observes declaration, her best response is to reward the promiser if the cost of doing so is less than the value of future votes he expects to receive from complying. That is:

$$\begin{aligned} v + f - pr &\geq v + (1 - p)f \\ -pr &\geq -pf \\ r &\leq f \end{aligned}$$

This condition holds, given the previously discussed assumption that the citizen's future votes are more valuable than the reward a politician pays (i.e., $r \leq f$).

Turning to the citizen's incentive compatibility constraints, the supporting promiser will declare if the utility of declaring (in which case *P* provides a reward) is weakly greater than the utility of not declaring (in which case *P* does not provide a reward):

$$\begin{aligned} x_s + d(x_s) + pr - (1 - p)z - c &\geq x_s \\ d(x_s) + pr - (1 - p)z &\geq c \end{aligned} \tag{C.1}$$

On the other hand, the opposing promiser will remain undeclared if the utility of not declaring (in which case *P* withholds the reward) is weakly greater than the utility of declaring (in which case *P* provides a reward):

$$\begin{aligned} x_n &\geq x_n + d(x_n) + pr - (1 - p)z - c \\ c &\geq d(x_n) + pr - (1 - p)z \end{aligned} \tag{C.2}$$

Thus, in order for separation, the following condition must hold:

$$\begin{aligned} d(x_n) + pr - (1 - p)z \leq c \leq d(x_s) + pr - (1 - p)z \\ d(x_n) \leq c - pr + (1 - p)z \leq d(x_s) \end{aligned} \tag{C.3}$$

If the condition in Inequality C.3 holds, then supporting promisers declare and opposing promisers do not declare. Under such conditions, separating equilibria exist. First, as discussed above, $x_s > x_n$, and given that $d(x_t)$ is a positive monotonic function of x_t, then $d(x_s) > d(x_n)$. Thus, the right side of Inequality C.3 is strictly greater than the left side. In a separating equilibrium, the politician updates her beliefs as indicated, and provides a reward if and only if she observed a declaration in the second step of the game. For the existence of a separating Perfect Bayesian Equilibrium, the condition provided by Equation C.3 is necessary as well as sufficient. In words, the center portion of the inequality, $c - pr + (1 - p)z$, refers to the material cost (or benefit, if

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negative) that either citizen type receives if he declares. The terms in left and right portions of the inequality, $d(x_t)$, are the expressive utility gain or loss for each citizen type from the act of declaring itself.

Inequality C.3 also reveals the conditions under which declaration provides an especially informative signal. When the politician observes a citizen declaring, each of the following conditions render the declaration more informative about the citizen's type: smaller clientelist rewards (r), larger punishments (z), higher declaration costs (c), and a lower probability (p) that the politician will win. But if these conditions are too extreme, pooling is observed as supporters opt not to declare. Likewise, pooling conditions exist in which all citizen types declare, rendering declaration non-informative.

In sum, this analysis shows conditions under which separating equilibria exist, such that declared support provides a mechanism for citizens to signal that their promises of votes are credible (i.e., they are supporting promisers). Again, a fuller characterization of the model would analyze pooling conditions as well as any conditions under which equilibria are nonexistent.

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