Incumbent Competition and Private Agenda

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Work In Progress

Abstract

Consider two politicians who decide whether to follow what they believe the public wants or choose the option that secures their private gain. Laws are passed when the politicians reach a unanimous decision. The public only rewards a politician when a law is passed, or when the politician is the only one whose action coincides with the public decision. We find that if the politicians are good enough decision-makers, a sufficiently high public regard in policy implementation given moderate private agenda payoffs pushes the politicians to take the action that generates a public benefit, implementing a socially optimal law. For very low decision-making skills, at sufficiently high policy rewards, we find that they vote for the same action to pass a law regardless of what the public wants. This gives rise to politicians converging to a decision that neither provides them with a private benefit nor follows exactly the public decision.

1 Introduction

The political agency model provides an interesting insight on how politicians, as rational agents, maximize their gains while they are in office. There have been a number of studies looking at the ideological positioning of candidates in electoral competition given voter preferences (Van Weelden, 2013; Matakos and Xefteris, 2014). The impact of re-election conditions on incumbent behaviour has also been explored significantly in the existing literature.

This model veers away from the preference-based analysis of decisions by incumbents and voters for elections. Instead, it focuses on the political agency model, specifically the agency problem on conflicting interests of the principal and the agent. Politicians are often faced with the decision to choose between what they believe the public wants, and what maximizes their private benefit. In an environment where there is more than one party involved, the policies enacted are determined by joint decisions of the incumbents. Although the personal preferences of a politician may come into play in deciding where in the spectrum the law will lie, the decision may also be influenced by the moves of the opposing party and their private agenda. This inherent feature of politics can be observed in most developed democracies. A good example of this is the United States legislative system, where bills are enacted after majority approval in both the House of Representatives and the Senate and the approval of the president. There has been an increased focus in the dynamics of legislation, including influence spheres and information flow. However, there has been a gap in the literature in the analysis of decisions taken by the two general party blocks in terms of their ability to anticipate the public choice and their vested interests.

Following Rivas (2015), this model looks at how decisions are made given the decisions of incumbent politicians – taking into consideration the conflict in public and private interests and their own decision-making abilities. The re-election condition is not considered in this model. The static nature of the game provides an alternative perspective from which one can view last period performance. Furthermore, politicians may not always look towards retaining their position as agents or enforcers of public will, as is often assumed in existing literature. The model looks at the decisions made during the term by two opposing politicians. In this competitive scenario, the decision of the opposing party and the characteristics that influence this decision will have an effect on the payoffs, and subsequently, the decisions made by the politicians. As most policies require a majority vote for passing a law, only a unanimous vote will enact a decision.

The desire to be popular amongst the electorate is also observed amongst the politicians, and the voters will provide a performance-based assessment of the incumbents. The model allows us to look at how policies are implemented during a term and looks at how the game unfolds on the level of competing politicians, given their own private interests, the public's response, and their decision-making abilities.

2 Related Literature

In the political agency model, the voters are perceived as the principal and the politicians as the agents. There are two main issues attached to principal agent relationships: the problem that arises when the desires of the agent and the principal are in conflict; and the cost and difficulty for principals to verify if the agent is properly carrying out its responsibilities.

Downs' 1957 seminal work, "An Economic Theory of Political Action in A Democracy", touched on the similarities faced by democratic systems and that of agencies. The significance of Downs' work lies in the novelty in which it views the role of the individuals in the government. Prior to Downs' work, the view that politicians always choose decisions that optimize the welfare of the public was prevalent. Downs argued that the view wherein politicians are rational agents looking to pursue their own agenda provides a better base upon which to develop an economic theory of government action. The work focused on the examination of the hypothesis: "Political parties in a democracy formulate policy strictly as a means of gaining votes," (Downs, 1957, p. 137). One of the axioms used in the development of this hypothesis stipulate that the government is under the full control of the winning party until the next election. Although it can be argued that in most political systems, the heads of state have the largest amount of de jure power, the assumption of full control on government decisions is still unlikely to be observed in democracy. Furthermore, the primary objective of popularity maximization in office is to secure re-election. This means that if competing parties have the same information set on voter preferences, a convergence on policy platforms can be observed (Alesina, 1988).

The difficulty in presenting an effective political agency model is due to the nature of political constitutions as incomplete contracts. The challenge lies in the fact that political constitutions only specifies "who has the right to make decision, and according to which procedures for which circumstances," (Persson, Roland, and Tabellini, 1997). While the clear setting of expectations and payoffs allows for effective monitoring in the traditional principal-agent model, the lack of delineation in rewards and punishments provides opportunities for politicians to misbehave. As the cost of acquiring information is high, and the impact a single voter is expected to have during elections is at best marginal, a rational voter will not exert any effort towards acquiring more information about the candidates (Downs, 1957). The implications of this in terms of ideological divisions between the candidates and electoral competition have been studied (Barro, 1973; Ferejohn, 1986; Alesina, 1988; Van Weelden, 2013; Aragones et al., 2007 Rivas, 2015). However, the analysis of voting and elections have largely been centered on how the condition of re-election affects imncumbent decisions. This model will instead focus on the process of legislation given the abilities of the politicians and decision-making skills to provide insight on how laws are passed and the environment that improves the pursuance of the socially-optimal choice.

The absence of concrete incentive schemes in the governmental positions creates room for rent-seeking in the government. Rent is often obtained through power and informational asymmetries (Persson, Roland, and Tabellini, 2007). Without proper mechanisms in place, a rational politician will try to maximize his gains given the two sources. Empirical evidence on rent-seeking and its negative impact on growth and development have been widely studied (See examples in Krueger, 1974; Mauro, 1995; Murphy et al., 1993). Rents, in the traditional sense, is characterized in this paper as the private agenda payoffs. It is asssumed that the public is unaware of the existence of the private benefit, and this is fixed regardless of what the socially optimal choice may be.

However, there is a component in the payoffs that are dependent on the public –the popularity-related payoffs. This encompasses public regard on the actions performed by the incumbents, similar to retrospective voting. The utility politicians obtain from public regard may depend on the value an individual places on fame, power, and reputation. However, the benefits from popularity also cover increases in power and influence. Network theory suggests that the ones with most connections are the most powerful ones, and have the best source of information.

The dynamics of power and how it potentially translates from de jure to de facto power, as studied by Acemoglu, Johnson and Robinson (2004), also provides additional motivation for politicians to strive and maintain popularity amongst the public. Retention of de facto power, in terms of resource accessibility and connections to those in power, is easier when one is perceived to be popular. Furthermore, although politicians cease to have official jurisdiction over decisions made upon retirement, their spheres of influence may allow them to impact some of the decisions made to their advantage. The existence of information asymmetries also provides an additional base upon which future gains can be made (Besley, 2006).

The model will provide insight primarily on the monitoring process, via the rewards from passing laws, but the analysis with respect to decision-making ability and rent will allow us to provide additional perspective on the selection of policy makers. In studies looking at dynamic settings, the concept of retrospective voting is also introduced. Political agency models assume that controls on politician's performance are imposed by the threat of non-reelection. The idea of retrospective voting, wherein voters assess candidates through the performance and delivery of promises from previous elections, is predicated on two key assumptions: (i) that the flow of information to the public is unimpinged, (ii) and the public's perception will affect voting outcomes. Besley and Burgess (2007) studied the role of media in government response particularly in crisis management and the impact of marginalized or poor voters. Their results corroborated the insufficiency of electoral competition as the sole mechanism to control government officials, and called for the public to demand government accountability beyond economic development. The establishment of effective transfer of infomation to voters will supplement formal institutions such as elections in improving government accountability.

For this specific model, both assumptions hold, but instead of the effect of public perception on voting outcomes, we assume that public perception affects the utility of politicians as discussed in the previous section. The theoretical findings of Besley and Burgess (2002) show that the public's response on policy affects government responsiveness. The public's response is modeled through the popularity-related payoffs, with payoffs in passing a law increasing as public regard increases.

Although the electoral process is thought to be the core mechanism to enforce public will within the government, this is not sufficient to effectively manage politicians (Persson, Roland, and Tabellini, 1997; Besley, 2006). The process of elections addresses four main issues, namely (i) the aggregation and representation of conflicting voter preferences, (ii) aggregation of information on correct political decisions, (iii) mitigation of the adverse selection problem and, (iv) control of moral hazard through official accountability (Persson, Roland, and Tabellini, 1997).

In this paper, we focus on the fourth issue of moral hazard and accountability through a feedback or popularity-based approach. As the politicians are already in office, the results will look at how different levels of public incentives affect the frequency of laws passed and its fit with the public choice. More importantly, the model provides insights on how incumbents interact and if they can be induced to make good decisions regardless of their abilities.

3 Model

3.1 Model Set-Up

There are two opposing politicians, $N = 2$, currently in office. For the purposes of this model, state of nature , $S \in \{0, 1\}$, represents the socially optimal decision (public choice) and is revealed at the end of the game. Both states are equally likely. Each politician will receive a signal $\theta_i \in \{0, 1\}$ on the state of nature, with an accuracy of q_i. The signal indicates what the politicians believe the choice of the public is. The quality of the signal, $q_i \in [\frac{1}{2}, 1]$, represents the decision-making ability of the politician, and can be characterized as follows.

$$P(\theta_i = S) = q_i$$

Both politicians know how good or bad a decision-maker they are. A signal quality of $\frac{1}{2}$ indicates that the signal is equally likely to be right and wrong. As the politicians are aware of their own decision-making ability, any signal with a quality lower than $\frac{1}{2}$ will prompt them to identify the state that is not the signal as the public choice, giving it an accuracy of $1 - q_i > \frac{1}{2}$. This imposes a signal quality floor at $q_i = \frac{1}{2}$. Decision-making ability is capped at 1, as the signal received by politicians with a decision-making ability of 1 is always accurate.

The politicians have the equal access to resources and information, and have the same decision-making ability. The decisions taken by the politicians are given by $A_i = \{0, 1\}$, and are played simultaneously.

The model focuses on the interaction between the incumbents rather than between a politician and the voters. The electorate in this model is assumed to be homogenous and well-informed. It follows that there will only be one socially optimal choice. Furthermore, the electorate is aware of the decisions made by the incumbent politicians, and reacts accordingly.

The politicians are assumed to enjoy their popularity in the electorate. Popularity, for the purposes of this paper, is characterized by electorate perceptions on incumbent performance based on the policies implemented. Their popularity is then dependent on the joint decisions made in the government. The specific decision-implementation popularity payoffs are given below:

$$\pi_{Pi} = \begin{cases} T & if A_i = A_{-i} = S, \\ B & if A_i = A_{-i} \neq S, \\ 0 & if A_i \neq S = A_{-i}, \\ 1 & if A_i = S \neq A_{-i}, \end{cases}$$

where $0 \leq B \leq T \leq 1$. A law is passed when both politicians choose the same action. The utility obtained from choosing the decision the public wants when the opposing party gets it wrong yields the highest value 1. This is primarily because the public perceives the politician with the correct decision as the effective agent. In contrast, choosing the wrong decision when the opposing party's decision coincides with that of the public does not yield the politician anything. The popularity payoffs for implementing a policy not in line with the public choice provides additional utility, $B > 0$, as the passing of the law is still seen as a positive, albeit not optimal, governmental response. When the optimal social choice is implemented, the politicians both receive an increase T in their utility, less than or equal what they would have received if the public positively identifies them as the effective agent. Aside from popularity-related changes in utility, a politician will also receive an increase of α in his utility if he takes the private decision -the decision that coincides with the state wherein his private agenda lies.

Assumption 1 : $T = B$

For this specific model, we assume that $T = B$, that is, the public will reward the politicians a certain value T if a law is passed. The same value is awarded regardless if the law passed is optimal or not (i.e. $T = B$). The distinction between optimal and suboptimal policy implementation will not be the primary thrust of this paper. The assumption allows us to focus primarily on whether or not laws get passed given the decisions politicians are faced.

Assumption 2 : The Private Choice is fixed at $S = 1$ for both politicians.

The private choice is $S = 1$ for both politicians. This is without loss of generality. The analysis and observations from this model can then further be extended to varying private agenda options in future works.

$$\pi_{Ri} = \begin{cases} 0 & if\, A_i = 0, \\ \alpha & if\, A_i = 1, \end{cases}$$

where $\alpha \geq 0$.

The utility values of a politician given the state of nature, S, and the actions, A_i, A_{-i}, taken by both parties are shown below:

$$u_i(S, A_i, A_{-i}) = \begin{cases} T & if A_i = A_{-i} = S = 0, \\ T+\alpha & if A_i = A_{-i} = S = 1, \\ T & if A_i = A_{-i} \neq S = 1, \\ T+\alpha & if A_i = A_{-i} \neq S = 0, \\ 0 & if A_i \neq A_{-i} = S = 1, \\ \alpha & if A_i \neq A_{-i} = S = 0, \\ 1 & if A_i = S \neq A_{-i} = 1, \\ 1+\alpha & if A_i = S \neq A_{-i} = 0. \end{cases}$$

Given the uncertainty in the environment, each politician will maximize their expected utility values given their private signal and decision-making ability and those of their opponent.

A more detailed explanation on the derivation of the expected utility values will be shown in the analysis below.

3.2 Strategies

The politicians can choose one of four strategies, σ, below:

- **Honest (H)**: Politician i employs the strategy Honest if he follows his signal, $A_i = \theta_i, \forall\, \theta_i$
- **Dishonest (D)**: Politician i is Dishonest if he always chooses the decision in which his private agenda lies, $A_i = 1, \forall\, \theta_i$.
- **"Zero" (Z)**: Politician i employs the strategy "Zero" if he always chooses $A_i = 0, \forall\, \theta_i$
- **Contrarian (C)**: Politician i is Contrarian if he always chooses the opposite of what his signal is, *i.e.*, $A_i = \theta_i^{'}$, where $\theta_i^{'}$ is different from the signal θ_i

The pure strategy space of Player i is given by:

$$\Sigma_i = \{H,\, D,\, Z,\, C\}.$$

There are 16 possible strategy profiles for this model:

$$\Sigma = \{(H,H),(H,D),(H,Z),(H,C),(D,H),(D,D),(D,Z),(D,C),$$

$$(Z,H),(Z,D),(Z,Z),(Z,C),(C,H),(C,D),(C,Z),(C,C)\}.$$

4 Analysis

4.1 Deconstructing Expected Utility Values

The politicians' expected utility values are given by the following :

$$EU_i(\sigma_i,\sigma_{-i}) = \sum_{s=0}^{1}[P(S=s)(T\,P(A_i=S)P(A_{-i}=S)+P(A_i=S)P(A_{-i}\neq S)+T\,P(A_i\neq S)P(A_{-i}\neq S)+\alpha P(A_i=1)]$$

The expected utility values are computed by obtaining the sum of the expected payoffs. The process of calculating the expected utility values is shown in detail below. Please note that the variable X and Y are only included as temporary value holders to better demonstrate the derivation process. X is the expected total payoff at $S=0$, while Y is the expected total payoff at $S=1$.

A. Computing the Expected Utility Value of Player 1 if he chooses strategy Honest, given Player 2 is Honest $(\sigma_1, \sigma_2 = H)$

$EU_1(\sigma_1, \sigma_2) = P[S=0]X + P[S=1]Y = \frac{1}{2}X + \frac{1}{2}Y = T + q(1-2T) - q^2(1-2T) + 0.5\alpha$

- $X = \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{q}_{\text{P}(A_i=\text{S})} \underbrace{q}_{P(A_{-i}=S|S=0)}}_{A_i=A_{-i}=\text{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}} \underbrace{q}_{\text{P}(A_i=\text{S})} \underbrace{(1-q)}_{P(A_{-i}\neq S|S=0)}}_{A_i=\text{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{(1-q)}_{\text{P}(A_i\neq\text{S})} \underbrace{(1-q)}_{\text{P}(A_{-i}\neq\text{S}|\text{S}=0)}}_{A_i=A_{-i}\neq\text{S}} + \underbrace{\alpha}_{\pi_{Ri}} \underbrace{(1-q)}_{\text{P}(A_i=1)}$

- $Y = \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{q}_{\text{P}(A_i=\text{S})} \underbrace{q}_{P(A_{-i}=S|S=1)}}_{A_i=A_{-i}=\text{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}} \underbrace{q}_{\text{P}(A_i=\text{S})} \underbrace{(1-q)}_{P(A_{-i}\neq S|S=1)}}_{A_i=\text{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{(1-q)}_{\text{P}(A_i\neq\text{S})} \underbrace{(1-q)}_{\text{P}(A_{-i}\neq\text{S}|\text{S}=1)}}_{A_i=A_{-i}\neq\text{S}} + \underbrace{\alpha}_{\pi_{Ri}} \underbrace{q}_{\text{P}(A_i=1)}$

The expected utility value above is computed for the case where Player i chooses Honest, following the signal, when his opponent is also Honest. Looking closely at X, one can see that for each possible value of the popularity-related payoff, the probabilities of each player choosing the action that fulfills the payoff criterion is multiplied to its value. In the above example, Player 1 receives a payoff of T if both he and the opponent choose an action that is equal to the State 0. As both players are Honest, the probability of them choosing the correct action is given by the quality of their signal, q, giving us the first addend of X, Tq^2. The second addend is determined the same way, with 1 as the payoff when Player 1 chooses the correct action, while Player 2 does not. We obtain $q(1-q)$ as the second addend, computed by getting the product of the payoff (1), the probability of Player 1 choosing correctly (q), and the probability of Player 2 choosing incorrectly (1-q). As we assume that the public is indifferent to what law is passed (See Assumption 1), the third addend, $T(1-q)^2$ is calculated by getting the product of the corresponding payoff for implementing the non-optimal law (T) and the probabilities of players 1 and 2 choosing incorrectly ($1-q$ for both). The last addend corresponds to the private agenda component of the expected utility. This is given by the product of the private agenda value (α) and the probability of Player 1 choosing Action 1 ($1-q$). The values for Y are calculated in the same manner, evaluating the probabilities of the players' actions attached to each possible popularity-related payoff and the private agenda component for State 1. The total Expected Utility Value is then obtained by getting the average expected payoffs for the states. As both states are equally likely, the expected total payoff of any player for all cases will be given by $\frac{1}{2}X + \frac{1}{2}Y$.

B. Computing the Expected Utility Value of Player 1 if he chooses strategy Dishonest, given Player 2 is Honest ($\sigma_1 = D, \sigma_2 = H$);

$EU_1(\sigma_1, \sigma_2) = P[S = 0]X + P[S = 1]Y = \frac{1}{2}X + \frac{1}{2}Y = 0.5 - 0.5q + 0.5T + \alpha$

- $X = \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{0}_{\mathrm{P}(A_i=\mathrm{S})} \underbrace{q}_{P(A_{-i}=S|S=0)}}_{A_i=A_{-i}=\mathrm{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}} \underbrace{0}_{\mathrm{P}(A_i=\mathrm{S})} \underbrace{(1-q)}_{P(A_{-i}\neq S|S=0)}}_{A_i=\mathrm{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{1}_{\mathrm{P}(A_i \neq \mathrm{S})} \underbrace{(1-q)}_{\mathrm{P}(A_{-i} \neq \mathrm{S}|\mathrm{S}=0)}}_{A_i=A_{-i} \neq \mathrm{S}} + \underbrace{\alpha}_{\pi_{Ri}} \underbrace{1}_{\mathrm{P}(A_i=1)}$

  $= T(1-q) + \alpha$

- $Y = \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{1}_{\mathrm{P}(A_i=\mathrm{S})} \underbrace{q}_{P(A_{-i}=S|S=1)}}_{A_i=A_{-i}=\mathrm{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}} \underbrace{1}_{\mathrm{P}(A_i=\mathrm{S})} \underbrace{(1-q)}_{P(A_{-i}\neq S|S=1)}}_{A_i=\mathrm{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}} \underbrace{(0)}_{\mathrm{P}(A_i \neq \mathrm{S})} \underbrace{(1-q)}_{\mathrm{P}(A_{-i} \neq \mathrm{S}|\mathrm{S}=1)}}_{A_i=A_{-i} \neq \mathrm{S}} + \underbrace{\alpha}_{\pi_{Ri}} \underbrace{1}_{\mathrm{P}(A_i=1)}$

  $= Tq + 1 - q + \alpha$

The second expected utility value example shown above is computed for the case where Player i chooses Dishonest, that is to always follow the private decision, when his opponent is Honest. As Player 1 is Dishonest, his decision is always wrong at State 0, and always right at State 1. The corresponding probabilities of Player 1 choosing the socially optimal choice for States 0 and 1 are 0 and 1, respectively. Similar to above, the opponent, the accuracy of Player 2's decision, under an Honest strategy, is given by the quality of his signal, q. Following the calculation process in the previous example, we obtain the expected utility value for player 1 when he chooses to be Dishonest given an Honest opponent.

4.2 Evaluating Best Responses and Equilibria

Each player's best response will be given by :

$$BR_i(\sigma_{-i}) = max_{\sigma_i}\, EU_i(\sigma_i|\sigma_{-i})$$

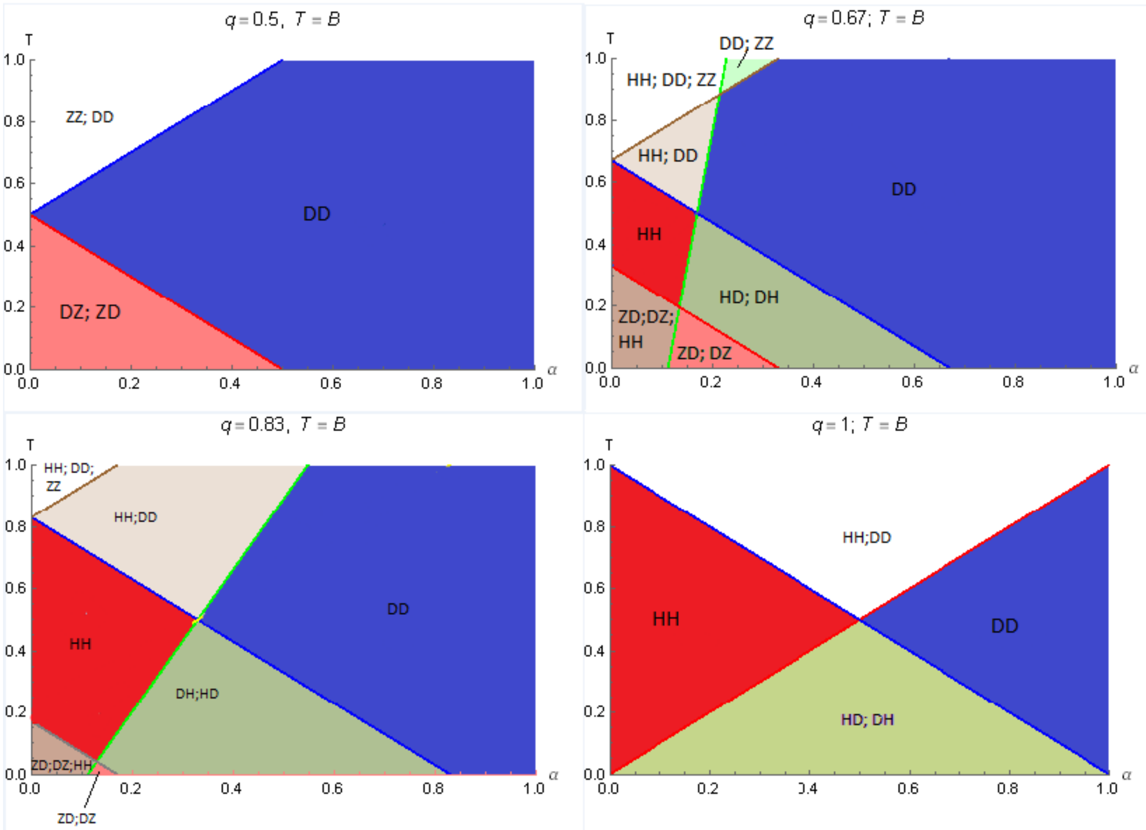
Lemma 1: The Contrarian Strategy is a Strictly Dominated Strategy

The Contrarian strategy, choosing the action opposite the signal received is a strictly dominated strategy for all potential opponent moves. With the Contrarian strategy (C), given that the decision-making ability q, ranges from $\frac{1}{2}$ to 1, the odds of making the right choice under this strategy, given by $1-q$, will be very small, ranging from 0 to $\frac{1}{2}$ per state. Furthermore, the decision where the private benefit lies is not prioritised. The probability of obtaining the private agenda with strategy Z will always be $\frac{1}{2}\alpha$. Given this, the payoffs from the Honest strategy (H), where the odds of making the right choice (q) ranges between $\frac{1}{2}$ and 1, and an expected private benefit of $\frac{1}{2}\alpha$, will always be higher than the payoffs of C. As players will always prefer strategy H over C regardless of opponent strategies, C is never chosen as a best response, making it a strictly dominated strategy.

The Nash Equilibrium, defined below, is then calculated upon the determination of the Best Responses for each strategy:

$$EU_i(\sigma_i^*, \sigma_{-i}^*) \geq EU_i(\sigma_i, \sigma_{-i}^*)$$

The analysis of equilibria within the parameter space shows patterns in the equilibrium for parameter combinations of T, as the ordinate, and α, in the abscissa. The figures below will serve as a guide in the analysis of the equilibria results.



The general trends that are captured in the figure above will be discussed more thoroughly in the succeeding sections. As the number of strategies have been reduced to three, the determination of the equilibrium becomes a much simpler process. The graphs above show the equilibria values at any combination of the permissible value of T and α for a given q. More specifically, the graph illustrates the equilibria maps for the decision making ability values of $q = \{0.5, 0.67, 0.83, 1\}$. For example, for the white area in the upper left corner the first graph at $q = 0.5$, multiple equilibria ZZ and DD exists for all T and α combinations within the area, given incumbent decision-making ability of 0.5.

Looking at the transition of the graphs from the worst decision-makers ($q = 0.5$) from the upper left corner to perfect decision-makers ($q = 1$), three main observations can be made. First, as decision making ability increases, the set of T and α combintations in which both politicians play Dishonest, DD, decrease as the incumbents' decision-making ability increases. Second, as the decision-making ability of incumbents increases, the number of T and α pairs in which both politicians play Honest, HH, increases. Third, at sufficiently high values of T, the equilibrium will result to incumbents choosing the same strategy, ensuring the passing of a law.

The equilibria representations shown above is formalized into the proposition below:

Proposition 1.

For any permissible values of the parameters T, q, and α,

1. There exists an equilibrium HH if and only if $T > 1 - \frac{q}{2q-1} + \frac{\alpha}{(2q-1)^2}$,
2. There exists an equilibrium DD if and only if $T > q - \alpha$,
3. There exists an equilibrium ZZ if and only if $T > q + \alpha$,
4. There exists equilibria DZ and ZD if and only if $T < 1 - q - \alpha$,
5. There exists equilibria DH and HD if and only if $T < 1 + \frac{q}{1-2q} + \frac{\alpha}{(1-2q)^2}$ and $1 - q - \alpha < T < q - \alpha$

In words, the above proposition summarizes the conditions on which each equilibrium can be found. Note that the condition for equilibrium ZZ, where both incumbents choose the decision "Zero" regardless of their signal, also satisfies the condition for equilibrium DD, where both incumbents follow the decision with the private benefit.

Whether or not the law passed is the socially optimal choice, depends on the decision-making abilities of the politicians and the size of their private benefit. The higher the private benefit, the propensity for dishonesty, taking the decision wherein the private benefit lies, increases. The conditions that underscore honesty as a stable equilibrium appear to be more complex than the conditions for dishonesty, not unlike what one can observe in the real world. Unsurprisingly, an increase in the size of the private benefit also steers the politicians from following the public decision and decreases the likelihood for a socially optimal law to be passed.

Increasing popularity-related payoff T increases the chances of a law being passed. However, it does not guarantee that the law is in line with the socially optimal choice. Extremely high rewards on law passing coupled with sufficiently small private benefit values could be to the public's detriment, as it provides politicians with the option to both shirk and settle on one decision, which is neither the socially optimal choice nor the one with the private benefit. Politicians may cease to follow what the public wants as they are rewarded for their decisions despite the implementation of subpar policies. Politicians with lower decision-making abilities are more susceptible to this behaviour than better decision-makers.

Corollary 1.

A law is always passed if the popularity-related payoff, T, is greater than $\frac{1}{2}$.

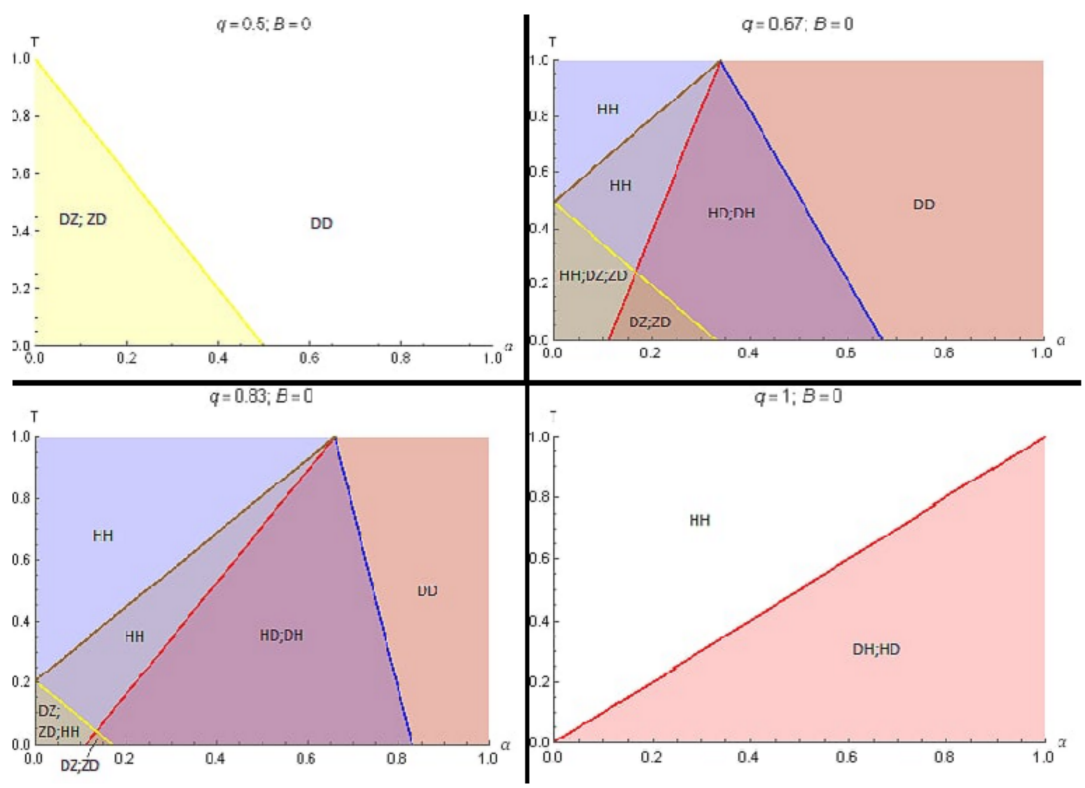
In general, an increase in popularity-related payoffs, particularly the payoffs related to the passing of a law, will increase the likelihood of a law being passed. Looking at all equilibrium conditions in Proposition 1, an increase in T will make all pooling equilibria more likely.

No policy will be passed with sufficiently low rewards for passing a law alongside low private agenda values, as the politicians will not have much to gain from trying to choose the socially optimal choice. One will decide to choose the option with the private agenda, while the other maximizes his expected payoff by capitalizing on his opponent's dishonesty. By choosing the remaining option (i.e. $A_i = 0$), the opponent increases his odds of being identified as the sole effective agent. Similarly at sufficiently low policy rewards, good enough decision-makers with moderate private benefits will find themselves diverging in strategies with one being dishonest and securing the private agenda values, and the other capitalizing on the other's dishonesty by following what he believes to be the public choice.

4.3 Variations in Popularity-Related Payoffs

Although an increase in popularity-related payoffs will increase the likelihood of honesty and subsequenty the passing of socially optimal laws, because there is no distinction between socially optimal and suboptimal laws, the room for politicians to ignore the wishes of the public also expands. Politicians are faced with different probable options to secure the rewards, and deciding according to what the voters want could potentially be the most work, it is not unlikely to see results that veer towards suboptimal laws being passed. The case where choosing the policy with no attached private agenda is an equilibrium at extremely high rewards and low private benefit values for sufficiently bad decision-makers shows this.

One way to induce honesty is to distinguish between the passing of laws that are socially optimal and those that are not. The previous case at $T = B$ only reacted to the passing of laws, and did not provide further examination of the law passed. In order to illustrate the effects of the distinction, we take the extreme case where there are no payoffs in policy unless it coincides with the socially optimal choice (i.e. $B = 0$). The equilibria resulting from distinguishing between policies are shown below:



Similar to the previous graphs, the above figure shows the equilibrium for parameter combinations of T (the ordinate) and α (the abscissa), given a decision making ability (q).

The first two observations from the original case on the decrease in the DD region and the increase in the HH region as decision-making ability increases hold true. The difference lies in the third observation.

The certainty of a law being passed at sufficiently high levels of T now disappears. This is primarily because there is no gain to be made in passing a suboptimal law.

In comparison to the original case where passing any law is given the same regard, the above case distinguishing optimal and suboptimal laws provides clear cut incentives for both politicians to be honest and follow the choice of the public. Increased awareness and scrutiny from the public on the laws that are passed will have an effect on the type of laws implemented. Although the problems of free-riding and costly information still persists, it is possible to curb dishonest behaviour and induce honest behaviour by increasing public regard on successful law implementation and a stronger perception on implementing public driven choices as a collective.

4.4 Variations in Private Agenda-Related Payoffs

Looking at the original case without policy distinction, an increase in private agenda-related payoffs will unambiguously increase the politician's propensity to be dishonest. As the private gains increase relative to the rewards one stands to gain from passing a law, a rational individual will tend to try and secure the private gains more. The negative impact on high private agenda or rent on politician attitudes in office have been well documented in previous studies (Krueger, 1974; Ferejohn, 1986; Rivas, 2015). The model results corroborate this by showing that an increase in the private gains available will induce dishonesty amongst elected officials. Although the maximum possible value to be obtained in the popularity-related payoffs is capped at one, values of $\alpha > 1$ are allowed for Private-Agenda Related payoffs. At $\alpha = 1$, the politician immediately chooses to be dishonest regardless of T, and is carried over for all private agenda payoffs greater than 1.

4.5 Variations in Decision Making Ability

An increase in decision making abilitiy reduces the T threshold for honesty as an equilibrium in both politicians, while increasing thresholds to choose dishonest and zero strategies. Unlike changes in the rewards of passing a law, the increase in decision-making ability singularly pushes for the implementation of socially optimal choices. Better decision-makers have more incentive to be honest as there is less risk in getting the socially optimal choice correctly. Decision-making ability will encompass both innate abilities and resource accessibility.

5 Conclusion

This paper aims to study a setting with two competing incumbent officials who have to take a decision in their term in office. The decision will be a trade-off between what he believes the public wants and the decision in which he stands to receive private benefits. There is no prospect of re-election in this model, but politicians experience satisfaction from being popular amongst the public. The results so far show how a politician's private interests and the electorate control, in the form of popularity payoffs, affect his incentives to follow the public decision. We find that the size of the private benefit will increase the propensity of politicians to be dishonest. In terms of electorate controls, the results indicate that positive public response on correct policy choices will increase the incentive for politicians to be honest, although it also provides incentives to collude and decide on one decision without regard to the public choice. Introducing a distinction between optimal and suboptimal policies will help delineate the strategies better and implement optimal policy choices. Furthermore, an increased requirement in decision-making of politicians will push towards the implementation of socially optimal laws. The impact of re-election and varying decision-making abilities will be interesting additions to the model in future extensions.

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Appendix: Proof of Lemma 1

Lemma 1 states that the Strategy C is a strictly dominated strategy.

We define a strictly dominated strategy as follows:

$\sigma_i' \in \Sigma_i$ is strictly dominated by $\sigma_i \in \Sigma_i$ if, for every $\sigma_{-i} \in \Sigma_{-i}$, $EU_i(\sigma_i, \sigma_{-i}) > EU_i(\sigma_i', \sigma_{-i})$.

Let $EU_i(\sigma_i, \sigma_{-i})$ be the value of $EU_i$when a certain plan $\sigma_i \in \{H,\ D,\ Z,\ C\}$is employed given opponent strategy $\sigma_{-i} \in \{H,\ D,\ Z,\ C\}$.

Under the Contrarian strategy, politicians will always choose the opposite of their signal, q. It follows then that the probability of choosing the correct decision under this strategy is $1-q$. In contrast, under the Honest strategy, politicians have a probability q of choosing the correct decision, as they always follow their signal.

In order to establish a concrete comparison, the expected utility values under strategies H and C are first obtained.

Given that the Opponent plays the Strategy Honest (H)

If the politician plans to employ H, given opponent strategy Honest, then it follows that.

$$
\begin{aligned}
&EU_i(H,H)\\
&= \tfrac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{q}_{P(A_{-i}=S|S=0)}}_{A_i=A_{-i}=\mathrm{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{(1-q)}_{P(A_{-i}\neq S|S=0)}}_{A_i=\mathrm{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{(1-q)}_{\mathrm{P}(A_i\neq\mathrm{S})}\ \underbrace{(1-q)}_{\mathrm{P}(A_{-i}\neq\mathrm{S}|\mathrm{S}=0)}}_{A_i=A_{-i}\neq\mathrm{S}} + \underbrace{\alpha}_{\pi_{Ri}}\underbrace{(1-q)}_{\mathrm{P}(A_i=1)}\right]\\
&+\tfrac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{q}_{P(A_{-i}=S|S=1)}}_{A_i=A_{-i}=\mathrm{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{(1-q)}_{P(A_{-i}\neq S|S=1)}}_{A_i=\mathrm{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{(1-q)}_{\mathrm{P}(A_i\neq\mathrm{S})}\ \underbrace{(1-q)}_{\mathrm{P}(A_{-i}\neq\mathrm{S}|\mathrm{S}=1)}}_{A_i=A_{-i}\neq\mathrm{S}} + \underbrace{\alpha}_{\pi_{Ri}}\ \underbrace{q}_{\mathrm{P}(A_i=1)}\right]\\
&= T + q(1-2T) - q^2(1-2T) + 0.5\alpha
\end{aligned}
$$

If the politician plans to employ C, given opponent strategy Honest, the resulting expected utility values are as follows.all permissible values of

$EU_i(C,H)$

$$= \frac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{q}_{P(A_{-i}=S|S=0)}}_{A_i=A_{-i}=\text{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{(1-q)}_{P(A_{-i}\neq S|S=0)}}_{A_i=\text{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(q)}_{\text{P}(A_i\neq\text{S})}\underbrace{(1-q)}_{\text{P}(A_{-i}\neq\text{S}|\text{S}=0)}}_{A_i=A_{-i}\neq\text{S}} + \underbrace{\alpha}_{\pi_{Ri}}\underbrace{(q)}_{\text{P}(A_i=1)}\right]$$

$$+\frac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{q}_{P(A_{-i}=S|S=1)}}_{A_i=A_{-i}=\text{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{(1-q)}_{P(A_{-i}\neq S|S=1)}}_{A_i=\text{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(q)}_{\text{P}(A_i\neq\text{S})}\underbrace{(1-q)}_{\text{P}(A_{-i}\neq\text{S}|\text{S}=1)}}_{A_i=A_{-i}\neq\text{S}} + \underbrace{\alpha}_{\pi_{Ri}}\underbrace{(1-q)}_{\text{P}(A_i=1)}\right]$$

$$= 1-2q+q^2(1-2T)+2Tq+0.5\alpha$$

Breaking down the expected utility values into components, we find that the private agenda payoff under the Honest and Contrarian strategy are the same at $\frac{1}{2}\alpha$.

For the popularity related payoffs, the expected utilities when a law is passed are:

$$T-2Tq(1-q),\ \textit{under } H, \quad (1) \quad \textit{and}$$

$$2Tq(1-q),\ \textit{under } C \quad (2).$$

For both C and H, the expected utility on policy implementation is increasing and monotonic in T for $q \in [\frac{1}{2}, 1]$.

Looking at the values above, it can be observed that the specific payoff under H (1) can be viewed as the difference between T and the value under strategy C (2). Differentiating (2) with respect to q, we find that the expected utility on policy implementation is maximized at $q=\frac{1}{2}$, given any T. At $T=1$, we obtain the maximum value of $\frac{1}{2}$. This implies that the minimum payoff on policy implementation under H is at $\frac{1}{2}$, making the values under H and C diverge as decision-making ability increases. Thus, for this component of the expected utility value, we find that the payoffs under H are greater than C for $q>\frac{1}{2}$.

The expected utilities when the politician is identified as the sole effective agent ($\pi_{P_i} = 1$) are as follows:

$$q(1-q),\ under\ H, \quad (3) \quad and$$

$$(1-q)(1-q),\ under\ C\ (4).$$

The maximum value under C is obtained when $q = \frac{1}{2}$ (See Equation 4). For all values of $q > \frac{1}{2}$, it is observed that the payoff under H is higher than the payoff under C, as $q \geq 1 - q$.

Putting all components together, evaluating the expected utility values given opponent strategy H, a politician will always prefer strategy H over C if $q > \frac{1}{2}$, and is indifferent between the two at $q = \frac{1}{2}$.

However, it is reasonable to expect that any rational politician who has terrible decision making skills (i.e. $q = \frac{1}{2}$) will prefer to act on Strategy H than C given potential positive externalities on being perceived as honest. Furthermore, at very low decision-making skills, rational individuals would more likely prefer to follow the decision where their private benefit lies to maximize their utility.

Given that the Opponent plays the Strategy Dishonest (D)

If the politician plans to employ H, given opponent strategy Dishonest, then it follows that.

$$EU_i(H, D)$$

$$= \frac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{0}_{P(A_{-i}=S|S=0)}}_{A_i=A_{-i}=\mathrm{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{(1)}_{P(A_{-i}\neq S|S=0)}}_{A_i=\mathrm{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{(1-q)}_{\mathrm{P}(A_i\neq\mathrm{S})}\ \underbrace{(1)}_{\mathrm{P}(A_{-i}\neq\mathrm{S}|\mathrm{S}=0)}}_{A_i=A_{-i}\neq\mathrm{S}} + \underbrace{\alpha}_{\pi_{Ri}}\ \underbrace{(1-q)}_{\mathrm{P}(A_i=1)}\right]$$

$$+\frac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{1}_{P(A_{-i}=S|S=1)}}_{A_i=A_{-i}=\mathrm{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\ \underbrace{q}_{\mathrm{P}(A_i=\mathrm{S})}\ \underbrace{(0)}_{P(A_{-i}\neq S|S=1)}}_{A_i=\mathrm{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\ \underbrace{(1-q)}_{\mathrm{P}(A_i\neq\mathrm{S})}\ \underbrace{(0)}_{\mathrm{P}(A_{-i}\neq\mathrm{S}|\mathrm{S}=1)}}_{A_i=A_{-i}\neq\mathrm{S}} + \underbrace{\alpha}_{\pi_{Ri}}\ \underbrace{q}_{\mathrm{P}(A_i=1)}\right]$$

$$= 0.5q + 0.5T + 0.5\alpha$$

If the politician plans to employ C, given opponent strategy Dishonest, the resulting expected utility values are as follows:

$$
\begin{aligned}
&EU_i(C,D)\\
&= \frac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{0}_{P(A_{-i}=S|S=0)}}_{A_i=A_{-i}=\text{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{(1)}_{P(A_{-i}\neq S|S=0)}}_{A_i=\text{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(q)}_{\text{P}(A_i\neq\text{S})}\underbrace{(1)}_{\text{P}(A_{-i}\neq\text{S}|\text{S}=0)}}_{A_i=A_{-i}\neq\text{S}} + \underbrace{\alpha}_{\pi_{Ri}}\underbrace{(q)}_{\text{P}(A_i=1)}\right]\\
&+\frac{1}{2}\left[\underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{1}_{P(A_{-i}=S|S=1)}}_{A_i=A_{-i}=\text{S}} + \underbrace{\underbrace{1}_{\pi_{P_i}}\underbrace{(1-q)}_{\text{P}(A_i=\text{S})}\underbrace{(0)}_{P(A_{-i}\neq S|S=1)}}_{A_i=\text{S}\neq A_{-i}} + \underbrace{\underbrace{T}_{\pi_{P_i}}\underbrace{(q)}_{\text{P}(A_i\neq\text{S})}\underbrace{(0)}_{P(A_{-i}\neq\text{S}|\text{S}=1)}}_{A_i=A_{-i}\neq\text{S}} + \underbrace{\alpha}_{\pi_{Ri}}\underbrace{(1-q)}_{\text{P}(A_i=1)}\right]\\
&= 0.5 - 0.5q + 0.5T + 0.5\alpha
\end{aligned}
$$

Comparing the expected utility values for strategies H and C, H provides a higher payoff than C $q > \frac{1}{2}$. **Similar to the previous case with opponent strategy σ_{-i} =H, a politician will always prefer strategy H over C if $q > \frac{1}{2}$, and is indifferent between the two at** $q = \frac{1}{2}$.

Following the derivation process above, we find that the same results appear in the comparison of expected utilities under strategies H and C for the remaining opponent strategies Z and C. We specificially found that **a politician will always prefer strategy H over C if $q > \frac{1}{2}$, and is indifferent between the two at** $q = \frac{1}{2}$.

As we are comparing the sum of payoff components, and the probability attached to opponent strategies remain constant in the both Honest and Contrarian approaches, the primary difference lies on the probabilities in which the player chooses the correct decision (q for H; $(1-q)$ for C). The accuracy of the decision under strategy C decreases as the decision-making ability of the politician increases. The divergence in expected utility values under strategies H and C is shown in the calculations above, and we find that for all opponent strategies σ_{-i},C is a dominated strategy (strictly dominated for $q > \frac{1}{2}$).