What Does it Take the Median Voter to Go for Nixon?[1]

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[1] This paper is a comment to A. Cukierman and M. Tommasi's paper "When Does It Take a Nixon to Go to China", published in *American Economic Review* 1998, vol 88, pp 180-97.

Abstract

In their influential paper "When Does it Take a Nixon to go to China", Cukierman and Tommasi (1998a) argue that "policy reversals" may occur. In their model a partly partisan incumbent government advertises (and commits to) post-election policy. They identify conditions under which certain policy (say extreme left-wing) is implemented by the "unlikely" (right-wing) party (policy reversal). We show that there is a serious flaw in their modelling of voting behaviour. When corrected, the model has no analytical solution, and comparative static exercises are not possible. Moreover, the most fundamental form of policy reversal (only Nixon) ceases to exist.

Keywords: Political Economy, Elections, Policy reversal

JEL classification codes: D72, D82

1 Introduction

In their influential paper "When Does It Take a Nixon to Go to China", Cukierman and Tommasi (1998a) (hereafter CT) model "policy reversals" within a political economy framework. They identify conditions under which a certain policy (say extreme left-wing) is implemented by the "unlikely" (right-wing) party, and define this as policy reversal. (For a non-technical presentation, see Cukierman and Tommasi 1998b).[1]

We claim that there is a serious flaw in CT's modelling of voting behavior: Suppose different policies are represented by a unidimensional variable x. A voter's preference for any policy x is given by the norm $-|x - x^*|$, where x^* is the voter's preferred policy or bliss point. Voters choose between two parties Left and Right with policy platforms x_L and x_R, respectively. Suppose the voters do not know the exact values of x_L and x_R and consider them stochastic variables. CT assume that a voter with bliss-point x^* will vote as follows

$$\begin{aligned} \text{Vote for L if } |Ex_L - x^*| &< |Ex_R - x^*| \\ \text{Vote for R if } |Ex_L - x^*| &> |Ex_R - x^*| \end{aligned} \tag{1}$$

In Dalen et. al. (2004) we show that (1) is inconsistent with expected utility maximization. The correct specification is as follows:

$$\begin{aligned} \text{Vote for L if } E|x_L - x^*| &< E|x_R - x^*| \\ \text{Vote for R if } E|x_L - x^*| &> E|x_R - x^*| \end{aligned} \tag{2}$$

To give an intuitive example, suppose that the L-party, instead of being left-wing, is an extremist party. However, voters do not know whether the

[1] There exists a small, related litterature on political signalling, see Schultz (2002) Harrington (1993), Letterie and Swank (1998), Roemer (1994) and Schultz (1996).

party is extremely right-wing (Nazi) or extremely left-wing (communist). Let a negative number indicate that the party is left-wing, and a positive number indicate that the party is right-wing, and suppose the distribution of the extremist party is symmetric around zero. Then $Ex_L = 0$. Consider a voter with bliss point at zero. According to (1), this voter will prefer the extremist party to a party with known policy platform x_R different from but arbitrarily close to zero. This obviously makes no sense. According to the correct specification (2), the same voter will choose the moderate party R rather than the extremist party.

In this paper we analyze the correctly specified CT model. We show that the equilibrium of the model cannot be solved analytically, hence the comparative static results cannot be replicated. Moreover, the most fundamental form of policy reversal (only Nixon) does not exist in equilibrium.

In the next section we derive the equilibrium of the correctly specified CT model. In section 3, we show that (only Nixon) policy reversal does not exist. The last section concludes. Most of the proofs are provided in the appendix.

2 The model

The CT-model goes as follows: Two parties, L (left-wing) and R (right-wing) compete for office. One of the parties is the incumbent government (assumed left-wing). Their preferences if elected are given by $h - |x_i - c_i - \varepsilon_i - \gamma|$, $i = L, R$. Here h denotes the intrinsic value for the government of staying in office, x_i is policy, and γ reflects external circumstances. Furthermore, c_i and ε_i represent the policy preferences that are known and unknown to the electorate, respectively. The preferences of a voter j are given by $-|x - \gamma - c_j|$, where c_j is an individual-specific parameter showing this voter's political preferences. The preferences of the median voter, c_m^c, are uniformly distributed on an interval $[\underline{c}, \overline{c}]$. The parameters are symmetrically distributed around 0.

The incumbent (but not the voters) first observes γ and ε_L, and then announces policy platform x_L. If the opposition wins, it sets its policy after the election, and implements its first best policy $x_R^* = c_R + \varepsilon_R + \gamma$, adjusting fully for external circumstances γ. Furthermore, if the opposition wins, the non-observable part ε_L of the incumbent's preferences is eliminated (as in CT). Hence, the expected utility of the incumbent is given by

$$V_L = P_L[h - |x_L - c_L - \varepsilon_L - \gamma|] - (1 - P_L)E|c_R + \varepsilon_R - c_L|, \tag{3}$$

where P_L is the probability of being reelected. Both γ and ε_i $i = \{L, R\}$ are assumed to be normally distributed with expectations 0 and variances σ_γ^2 and σ_ε^2, respectively. Thus, *ex ante* the uncertainty regarding the two parties' preferences is equal.

When voting for the incumbent, the expected utility of a type j voter as a function of advertized policy x_L, is $-E^{\gamma|x_L}|x_L - \gamma - c_j|$, where $\gamma|x_L$ denotes the distribution of γ conditioned on the observation of the policy announcement x_L, hereafter referred to as γ_x. If the party in opposition is elected, the expected utility of the voter is equal to $-E|c_R + \varepsilon_R - c_j|$. It follows that a type j voter prefers the incumbent iff $E|x_L - \gamma_x - c_j| < E|c_R + \varepsilon_R - c_j|$. Note that if the incumbent chooses policy x_L, the expected policy of the opponent is $c_R + E\gamma_x$.

CT impose on their equilibrium that the voters expect the right-wing party's policy to be to the right of the left-wing party's proposed policy x_L for all values of x_L (their Assumption 1). As this is inconsistent with Bayesian updating we do not make this "assumption".

In a separating equilibrium, the incumbent's policy x_L is a deterministic function of his "type" $u_L \equiv \varepsilon_L + \gamma$ (analogous to equation 7 in CT),

$$x_L = B(u_L)$$

Since we look at a separating equilibrium, B is monotone. Hence, we can write $u_L = B^{-1}(x_L)$. Note that the conditional distribution γ_x is normal with mean $\theta B^{-1}(x_L)$ and variance $\theta\sigma_\varepsilon^2$, where $\theta := \sigma_\gamma^2/(\sigma_\gamma^2 + \sigma_\varepsilon^2) < 1$.

With the correct voting rule, uncertainty regarding a party's policy reduces its attractiveness, as shown in the next proposition

Proposition 1 *Consider a voter with utility function given by $-|x-c|$, and suppose x is stochastic with distribution function F. Then a mean-preserving spread in F increases the expected loss for the voter.*

If the incumbent is elected, the uncertainty for the voters regards γ_x, as the government's policy represents a bliss point for voters given by $x_L - \gamma_x$. If the opposition is elected, the uncertainty for the voters regards the oppositions' political preferences ε_R. Note that $var\ \varepsilon_R = \sigma_\varepsilon^2 > var\ \gamma_x = \theta\sigma_\varepsilon^2$. The lower uncertainty associated with the incumbent's policy gives the incumbent an advantage:

Corollary *Suppose the policy of the incumbent is equal to the expected policy of the opposition: $x_L = c_R + E\gamma_x$. Then the incumbent wins with probability* 1.

When the expected policies of the two parties are equal, only variance matters for all voters. Since the incumbent's variance is lower, it follows that all voters prefer the incumbent, who therefore wins with probability 1. Due to continuity, it follows that the incumbent will also win with probability 1 on an interval around $c_R + E\gamma_x$.

In Dalen et. al. (2004) we show that the median voter theorem still applies. Thus (as eq. (12) in CT):

$$P_L(x_L) = \frac{c_m^c(x_L) - \underline{c}}{\overline{c} - \underline{c}} \tag{4}$$

where $c_m^c(x_L)$ denotes the ideological position of the voter that is indifferent between the two parties, implicitly defined by the equation

$$E|x_L - \gamma_x - c_m^c| = E|c_R + \varepsilon_R - c_m^c| \tag{5}$$

Note that the relationship between c_m^c and x_L is non-trivial.

Along the equilibrium path $x_L = B(u_L)$, the derivative of $P_L(x_L)$ is given by (see appendix)

$$\frac{\partial P^L}{\partial x_L} = [1 - \theta B^{-1\prime}(x_L)] \frac{F_L(c_m^c) - 1/2}{F_L(c_m^c) - F_R(c_m^c)} \frac{1}{\overline{c} - \underline{c}} \tag{6}$$

for $P_L < 1$, where F_L denotes the distribution of $x_L - \gamma_x$, F_R the distribution of $c_R + \varepsilon_R$ and where the relationship between c_m^c and x_L defined by (5) is supressed for convenience. Maximizing (3) with respect to x_L yields the first order condition

$$\frac{\partial V_L}{\partial x_L} = -P_L + [h - (x_L - c_L - \varepsilon_L - \gamma) + E|c_R + \varepsilon_R - c_L|] \frac{\partial P_L}{\partial x_L} = 0,$$

taking into account that the party in equilibrium "shades" towards the political centrum, $x_L > \varepsilon_L + \gamma + c_L$. Replacing $\varepsilon_L + \gamma$ by u_L and inserting (6) yields the following first order differential equation

$$B'(u_L) = \theta \left[1 - \frac{c_m^c - \underline{c}}{h - (B(u_L) - c_L - u_L) + E|c_R + \varepsilon_R - c_L|} \frac{F_L(c_m^c) - F_R(c_m^c)}{F_L(c_m^c) - 1/2} \right]^{-1} \tag{7}$$

Equation (7) holds for $P < 1$. We know that $P_L = 1$ if x_L is close to Ex_R. If $P_L = 1$, the incumbent will set policy equal to its preferred policy (or bliss point), $x_L = c_L + \varepsilon_L + \gamma$. Let x_L^1 denote the lowest value of x_L such that 1) the incumbent chooses its preferred policy and 2) wins with probability 1. Let u_L^1 denote the associated value of $\varepsilon_L + \gamma$ (equal to $u_L^1 = x_L^1 - c_L$). Then x_L^1 is given by

$$E^{\gamma|u_L^1}|x_L^1 - \gamma - \overline{c}| = E|c_R + \varepsilon_R - \overline{c}|$$

The terminal condition $x_L^1 = c_L + u_L^1$ together with equation (7) determines $B(x_L)$ up to $x_L = x_L^1$. For realizations of u_L above u_L^1 we have that $x_L = c_L + u_L$ and $P_L = 1$.

For a sufficiently high value of u_L the L-party becomes the right-wing party in the sense that voters to the left prefer the R-party and voters to the right prefer the L-party. Let x_L^t denote the point at which the L-party and the R-party pursue the same policy in expected terms, $x_L^t = Ex_R|x_L$. Let u_L^t denote the corresponding value of u. As the incumbent chooses its first best policy, it follows that $Ex_R|x_L = c_R + \theta(x_L - c_L)$, hence $x_L^t = c_L + \frac{c_R - c_L}{1-\theta}$. For values of u_L above u_L^t, the L-party is considered more and more right-wing, and at some point the probability of winning drops below one. The L-party starts to shade to the left. Again, equilibrium is determined by a differential equation analogous to (7).

As $c_m^c(x_L)$ is hard to characterize, it is not possible to solve (7) analytically. Thus, it is extremely difficult to make comparative statics analyses of the model.

3 Policy reversal

CT are mostly concerned with policy reversal. The most fundamental form of policy reversal is when there exist extreme policies that only an incumbent from the "other side" can implement. CT refers to this as "only Nixon" policy reversal (hereafter referred to as policy reversal). In this case, it does indeed take a "Nixon to go to China".

We show that policy reversal does not exist in the correctly specified model. That is, there does not exist a right-wing policy x' such that 1) with positive probability, the policy will be implemented by a party that is perceived to be more left-wing than its opponent, and 2) with zero probability the policy will be implemented by the right-wing party.

The L-party is only perceived to be left-wing if voters, after observing x_L, expect that x_R will be to the right of x_L. Thus, we require that $x_L \leq x_L^t$ defined above. Note that if $x_L > x_L^t$, the L-party is perceived to be to the right of the R-party, and will attract right-wing voters while the R-party will attract left-wing voters. If this is the case, it seems unreasonable to refer to the L-party as the "unlikely" party to implement right-wing policy.

The most right-wing policy the L-party can implement and still be considered as the left-wing party is thus x_L^t, in which case it will win with probability one. We will show that the right-wing party with a strictly positive probability will choose policy $x_R > x_L^t$ and win with a strictly positive probability. This gives us the following proposition:

Proposition 2 *Policy reversal (only Nixon) does not exist in equilibrium.*

Although most of the proof is found in the appendix, some of the core elements are provided below. Let x_R^P denote the least upper bound for policies that the R-party as an incumbent can implement. Policy reversals exist whenever $x_L^t > x_R^P$. We thus have to show that $x_L^t \leq x_R^P$

The probability that the R-party wins if it advertises x_L^P is clearly 0. Furthermore, at x_R^P, the right-wing incumbent is indifferent to winning and losing: If not, the incumbent could obtain strictly positive expected payoff by shifting policy marginally to the left and win with strictly positive probability (due to continuity). Thus, x_R^P satisfies the following conditions:

- Indifference: $h - |x_R - u - c_R| = -E|c_L + \varepsilon_R - c_R|$
- Zero probability of winning: $E^{\gamma|x_R^P}|x_R^P - \gamma - \overline{c}| = E|c_L + \varepsilon_L - \overline{c}|$

The value of x_R^P is determined at the intersection between the two lines. In the appendix we use this to show that $x_L^P > c_L + 2(\overline{c} - c_L)/(1-\theta)$, which is strictly greater than x_L^t. Hence $x_L^t < x_R^P$, implying that party R has a strictly positive probability of proposing and implementing all policy proposals that party L can implement and still be perceived as the left-wing party. We thus conclude that policy reversal does not exist.

4 Conclusions

We have shown that there is a flaw in the way Cukierman and Tommasi model voter behavior in their paper "When Does it Take a Nixon to Go to China". When this flaw is corrected, the equilibrium of the model has no analytical solution, and the comparative static results cannot be replicated. Moreover, the most fundamental form of policy reversal (only Nixon) is no longer an equilibrium phenomenon.

We have not analyzed whether a milder form of policy reversal exists, which would require that the unlikely party is the party most likely to implement extreme policies. As the model is impossible to solve analytically, it is extremely difficult to identify conditions for when (if at all) such policy reversals would exist.

Appendix

Proof of proposition 1

Applying integration by parts on the loss function yields

$$\begin{aligned}
-E|x-c| &= -\int_{-\infty}^{\infty}|x-c|dF(x) \\
&= \int_{-\infty}^{c}(x-c)dF(x)-\int_{c}^{\infty}(x-c)dF(x) \\
&= -\int_{-\infty}^{c}F(x)dx-\int_{c}^{\infty}(1-F(x))dx \qquad (8)
\end{aligned}$$

Suppose first that $Ex = c$. Transferring probability mass from the centre to the tails unambiguously increases F below the mean and increases $1 - F$ above the mean, and it follows from (8) that the expected loss strictly increases. Consider then a situation where $Ex > c$. If the transfer of probability mass involves no transfer from above c (i.e., $x > c$) to below c (i.e. $x < c$) this has no impact on the expected loss. However, if the transfer involves a transfer from above to below c, this increases both integrals in (8), and hence strictly increases the expected loss. Since an increase in the variance of a normally distributed variance always involves a transfer from above to below c (again assuming that $Ex > c$), the last part of the proposition follows.

Derivation of equation (6)

c_m^c is determined as follows: Given the announced policy x_L, a type c_j voter prefers the incumbent (the opposition) if

$$\begin{aligned}
H(x_L;c_j) \quad &: \quad = -E|a_L-c_j|+E|a_R-c_j| \\
&\equiv -\int_{-\infty}^{c_j}[F_L(a)-F_R(a)]da+\int_{c_j}^{\infty}(F_L(a)-F_R(a))da \\
&\equiv Ea_R-Ea_L-2\int_{-\infty}^{c_j}[F_L(a)-F_R(a)]da > (<)0.
\end{aligned}$$

where $a_L := x_L - \gamma_x$ and $a_R := c_R + \varepsilon_R$ are normally distributed, $a_L \sim N(x_L - \theta B^{-1}(x_L), \theta\sigma_\varepsilon^2)$ and $a_R \sim N(c_R, \sigma_\varepsilon^2)$ and where $F_L(a)$ and $F_R(a)$ denote the respective distribution functions. c_m^c is implicitly defined by the equation $H(x_L, c_m^c) = 0$, which yields

$$\frac{\partial c_m^c}{\partial x_L} = -\frac{H_x}{H_c}$$

where

$$\begin{aligned} H_c &= \frac{\partial H}{\partial c} = -2[F_L(c_j) - F_R(c_j)] \\ H_x &= \frac{\partial H}{\partial x_L} = [2F_L(c_j) - 1](1 - \theta B'^{-1}(x_L)), \end{aligned}$$

Together, with

$$\frac{\partial P^L}{\partial x_L} = \frac{\partial c_m^c}{\partial x_L} \frac{1}{\overline{c} - \underline{c}}$$

these three equations defines (6).

Deriving an upper bound on x_R^P

In the $u, x-$ space, the indifference curve is given by $0 = h - |x - c_R - u| + E|c_L + \varepsilon_L - c_R|$, hence the slope is 1. The zero probability curve is implicitly defined by the equation $E|c_L + \varepsilon_L - \overline{c}| = E^{\gamma|x}|x_R - \gamma - c_R|$. Furthermore $E^{\gamma|x}|x - \gamma| = x - \theta u$ in equilibrium (recall that $u = \gamma + \varepsilon$ and that the equilibrium is fully revealing). Thus, the zero-probability of winning curve (hereafter the zero probability curve) is a straight line with slope $1/\theta$ in the $u, x-$ space.

x_R^P is determined as the intersection point between the zero-probability curve (which has slope $1/\theta > 1$) and the incumbent's indifference curve (slope equals one). Figure 1 characterizes an upper bound of x_R^P.

The zero probability curve is the steepest curve. Consider the intersection point with the x-axes as u equals 0. Due to incumbency advantage, this point is certainly above $\overline{c} + (\overline{c} - c_L)$, where $\overline{c} - c_L$ is the distance from $\overline{c}$ to the the expected left-wing policy x_L^e where $x_L^e = c_L + \gamma_x \equiv c_L + \theta u = c_L$. Hence we know that the zero probability curve is south-east of the curve passing through $\overline{c} + (\overline{c} - c_L)$, indicated by the dotted line.

Consider next the incumbent indifference curve. The incumbent is indifferent if $h - |x - u - c_R| = -E|c_L + \varepsilon_L - c_R|$, that is $x = -h + u + c_R - E|c_L + \varepsilon_L - c_R|$. Now $E|c_L + \varepsilon_L - c_R| > |c_L + E\varepsilon_L - c_R| = c_R - c_L$. Thus $x < -h + u + c_R - c_R + c_L \leq u + c_L$. Accordingly the incumbent indifference curve is north-west of the curve passing through c_L for $u = 0$. The two curves intersect at $x = c_L + 2(c_L - \overline{c})/(1 - \theta)$ which represents a lower bound of x_R^P.

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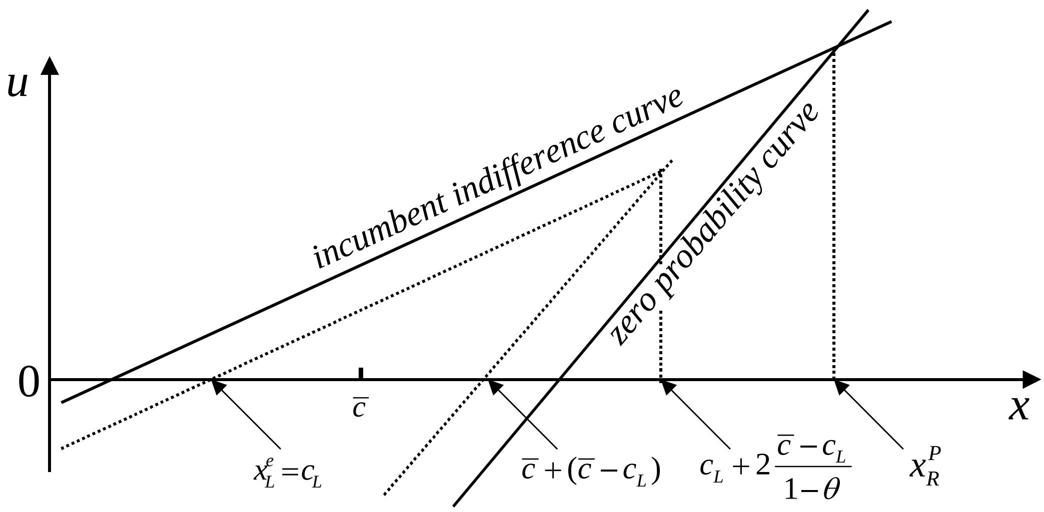

u
0
x
incumbent indifference curve
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$c_L + 2\dfrac{\bar{c} - c_L}{1-\theta}$
x_R^P

Figure 1: