Loss Aversion in Politics

Online Appendix

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Proof. Proposition 1

i) Implicit differentiating (5) w.r.t. t_i, and using A1-A3 yield

$$\frac{\partial p_i}{\partial t_i} = \begin{cases} -\frac{(1+\lambda)B_{pt}(t_i,p_i)-C_{pt}(t_i,p_i)}{(1+\lambda)B_{pp}(t_i,p_i)-C_{pp}(t_i,p_i)} > 0 & \text{if} \quad t_i < \check{t} \\ 0 & \text{if} \quad \check{t} \leq t_i \leq \hat{t} \\ -\frac{B_{pt}(t_i,p_i)-(1+\lambda)C_{pt}(t_i,p_i)}{B_{pp}(t_i,p_i)-(1+\lambda)C_{pp}(t_i,p_i)} > 0 & \text{if} \quad t_i > \hat{t} \end{cases}$$

Therefore bliss points are unique and (weakly) monotone in types. The policy outcome is the median's bliss point, p_m. If $\check{t} \leq t_m \leq \hat{t}$ then $p_m = p^S$. The outcome is the status quo.

ii) Let $t_m^1 \in \left[\check{t}, \hat{t}\right]$ be the median of the type distribution at time 1, and let θ be a shock affecting the median at time 2: $t_m^2 = t_m^1 + \theta$. A policy change occurs at time 2 only if $\theta > \hat{t} - t_m^1 \geq 0$, or $\theta < \check{t} - t_m^1 \leq 0$. Inertia is more likely if λ is larger. This follows from the fact that the size of the group of intermediate types is increasing in loss aversion, which we show below. Recall that $\check{t}$ is implicitly determined by $(1+\lambda)B_p(t,p^S) - C_p(t,p^S) = 0$, and $\hat{t}$ is implicitly determined by $B_p(t,p^S) - (1+\lambda)C_p(t,p^S) = 0$. Implicit differentiation yields

$$\frac{\partial \check{t}}{\partial \lambda} = -\frac{B_p(\check{t},p^S)}{(1+\lambda)B_{pt}(\check{t},p^S) - C_{pt}(\check{t},p^S)} < 0 \quad \text{and} \quad \frac{\partial \hat{t}}{\partial \lambda} = -\frac{-C_p(\hat{t},p^S)}{B_{pt}(\hat{t},p^S) - (1+\lambda)C_{pt}(\hat{t},p^S)} > 0 \tag{23}$$

where inequalities follow from the fact that, by A3, the denominators of the two above expressions are positive. Therefore, as λ increases some "small" shocks might not be sufficient to lead an intermediate median t_m^1 to desire a policy change.

iii) Suppose $t_i < \check{t}$, then by (5) $p_i \neq p^S$ solves the FOC $(1+\lambda)B_p(t_i,p) - C_p(t_i,p) = 0$. Then $B_p(t_i,p) - C_p(t_i,p) = -\lambda B_p(t_i,p) < 0$. Voter i's bliss point with loss aversion is higher than i's bliss point with no loss aversion. Similarly, if $t_i > \hat{t}$ then i's bliss point with loss aversion is lower than with no loss aversion. Thus loss aversion yields a moderating effect on voter's preferences. It is easy to see that this moderating effect is increasing in the loss aversion parameter.

Consider now the equilibrium outcome. If $t_m < \check{t}$, then by (5) $p_m < p^S$ solves $(1+\lambda)B_p(t_m,p) - C_p(t_m,p) = 0$. It follows that $B_p(t_m,p) - C_p(t_m,p) = -\lambda B_p(t_m,p) < 0$. This means that the policy that maximizes the median's indirect utility with loss aversion would be too high if there was no loss aversion. Thus the policy outcome is a higher policy, compared to the case with no loss aversion. Following the same steps, if $t_m > \hat{t}$ the median's optimality condition is $B_p(t_m,p) - C_p(t_i,p) = \lambda C_p(t_m,p) > 0$. In this case the policy outcome p_m is lower compared to the case with no loss aversion. Note that this moderation effect is stronger if the loss aversion parameter λ is larger. To see it, consider that, by (5), bliss points represent interior solutions for high and low types. By A1-A2, implicit differentiating of (5) for $i = m$ yields,

$$\frac{\partial p_m}{\partial \lambda} > 0 \qquad \text{if} \quad t_m < \check{t}$$
$$\frac{\partial p_m}{\partial \lambda} < 0 \qquad \text{if} \quad t_m > \hat{t}$$

iv) Let the "high" and the "low" status quo be, respectively, p^{S1} and p^{S2} (with $p^{S1} > p^{S2}$), and let the inertia interval under p^{S1} and p^{S2} be $\left[\check{t}^1, \hat{t}^1\right]$ and $\left[\check{t}^2, \hat{t}^2\right]$, respectively. By the definition of $\check{t}$ and $\hat{t}$ (cf. the proof of part *ii)* above),

$$\frac{\partial \check{t}}{\partial p^S} = -\frac{(1+\lambda)B_{pp}(\check{t},p^S) - C_{pp}(\hat{t},p^S)}{(1+\lambda)B_{pt}(\check{t},p^S) - C_{pt}(\check{t},p^S)} > 0 \quad \text{and} \quad \frac{\partial \hat{t}}{\partial p^S} = -\frac{B_{pp}(\check{t},p^S) - (1+\lambda)C_{pp}(\hat{t},p^S)}{B_{pt}(\hat{t},p^S) - (1+\lambda)C_{pt}(\hat{t},p^S)} > 0$$

Thus both $\check{t}$ and $\hat{t}$ are increasing in the status quo. Therefore, $\check{t}^2 < \check{t}^1$ and $\hat{t}^2 < \hat{t}^1$. Suppose $\hat{t}^2 < t_m < \check{t}^1$. In this case the median wants to increase the policy under

p^{S2}, but she wants to decrease it under p^{S1}. By (5), in the former case she chooses a level of the policy, call it p_m^2, that solves $B_p(t_i, p) - (1+\lambda)C_p(t_i, p) = 0$; in the latter cases she chooses a level p_m^1 that solves $(1+\lambda)B_p(t_i, p) - C_p(t_i, p) = 0$. Then $p_m^1 > p_m^2$.

Following the same steps, if $p^{S1} < p^{S2}$ and $\hat{t}^1 < t_m < \check{t}^2$ then $p_m^1 < p_m^2$.

v) Suppose in period 1 a shock on the voters' preferences leads the median to prefer a higher policy than the status quo: $t_m > \hat{t}^1$. By (5), the new policy $p^1 = p_m$ solves $B_p(t_m, p) - (1+\lambda)C_p(t_m, p) = 0$. In period 2, p^1 becomes the status quo: $p^1 = p^{S2}$. By statement *iv)* above, $\hat{t}^2 > \hat{t}^1$. Specifically, $\hat{t}^2$ solves $B_p(t, p^{S2}) - (1+\lambda)C_p(t, p^{S2}) = 0$. Since $p_m = p^1 = p^{S2}$, we have $B_p(t, p_m) - (1+\lambda)C_p(t, p_m) = 0$. Then $\hat{t}^2 = t_m$. Thus in period 2 the median type is the upper limit of the inertia range $\left[\check{t}^2, \hat{t}^2\right]$. This implies that the new status quo $p^{S2} = p_m$ beats any lower alternative with more than the simple majority of votes in favor. Following the same steps it is possible to prove that if $t_m > \hat{t}^1$, then $\check{t}^2 = t_m$. Once a *lower* policy becomes the status quo, it beats any higher alternative with more than the simple majority of votes in favor.

■

Proof. Proposition 2

i) Consider a young voter i in period 1. For simplicity there is no discounting for future utility. Bliss points in period 1 are sequentially rational and maximize lifetime utility. First we prove that i's bliss point is the same in both periods. We proceed backwards: in period 2, the bliss point maximizes residual lifetime utility, $V(t_i, p^2 \mid p^1)$:

$$p_i^2 \in \arg\max_{p^2} \begin{cases} V(t_i, p^2) - \lambda\left[C(t_i, p^2) - C(t_i, p^1)\right] & \text{if} \quad p^2 \geq p^1 \\ V(t_i, p^2) - \lambda\left[B(t_i, p^1) - B(t_i, p^2)\right] & \text{if} \quad p^2 < p^1 \end{cases}$$

Thus,

$$p_i^2 \text{ solves } \begin{cases} B_p(t_i, p^2) - (1+\lambda)C_p(t_i, p^2) = 0 & \text{s.t.} \quad p^2 > p^1 \\ p^2 = p^1 & \text{otherwise} \\ (1+\lambda)B_p(t_i, p^2) - C_p(t_i, p^2) = 0 & \text{s.t.} \quad p^2 < p^1 \end{cases} \tag{24}$$

This ideal policy is a function of the state variable, p^1. Let $p_i^2 = G(p^1)$ denote this function.

At time 1, voter i chooses her bliss point p_i^1 taking into account the consequences of her choice today on her future preferences:

$$p_i^1 \in \arg\max_{p^1} \left\{ V(t_i, p^1 \mid p^0) + V(t_i, G(p^1) \mid p^1) \right\}$$

We now prove she has no incentive to choose $p^1 \neq G(p^1)$; i.e., in period 1 her ideal policy is not different from her ideal policy in period 2. Suppose, by contradiction she does. Say, $p^1 < G(p^1)$. Assume also that $p^1 > p^0$. In this case, after some algebraic manipulation, we can re-write the above objective function as:

$$\begin{aligned} & B(t_i, p^1) - C(t_i, p^1) + B(t_i, G(p^1)) - C(t_i, G(p^1)) \\ & - \lambda \left[C(t_i, G(p^1)) - C(t_i, p^0) \right] \end{aligned}$$

Recall that $p^1 > p^0$. Thus the interior solution solves:

$$\frac{\partial B(t_i, p^1)}{\partial p^1} - \frac{\partial C(t_i, p^1)}{\partial p^1} + \frac{\partial B(t_i, p_i^2)}{\partial p_i^2} \frac{\partial p_i^2}{\partial p^1} - (1+\lambda) \frac{\partial C(t_i, p_i^2)}{\partial p_i^2} \frac{\partial p_i^2}{\partial p^1} = 0$$

Since $p^1 < p_i^2 = G(p^1)$, by implicit differentiating (24) above, $G'(p^1) = \frac{\partial p_i^2}{\partial p^1} = 0$.

Thus, if $p^0 < p^1 < p_i^2$, the last two terms of the above equation are zero. Then the equation which pins down the median's most preferred policy in period 1 is

$$\frac{\partial B(t_i, p^1)}{\partial p^1} - \frac{\partial C(t_i, p^1)}{\partial p^1} = 0$$

Observe that in this case the policy is chosen rationally, i.e., the ideal policy is the same as in the case with no loss aversion. But this is a contradiction, because if voter i chooses the policy rationally in period 1, then she will have no chance to increase her utility in period 2 other than keeping that policy unchanged. Thus, the policy she chooses in period 1 must be the same as the policy she chooses in period 2. But this contradicts the assumption that $p^1 < p_i^2$. Applying the same rationale, it can be proved that a contradiction arises also in the other three cases: 1. $p^0 > p^1 < p_i^2$; 2. $p^0 < p^1 > p_i^2$; 3. $p^0 > p^1 > p_i^2$. This proves that $p_i^1 = p_i^2$: in period 1 voter i's ideal policy is the same as in period 2.

In period 1, voter i sets p_i^1 so as to maximize her lifetime utility at period 1, $V(t_i, p^1 \mid p^0) + V(t_i, G(p^1) \mid G(p^1))$, which can be rewritten as:

$$\begin{cases} 2\,B(t_i, p^1) - 2\,C(t_i, p^1) - \lambda\,[C(t_i, p^1) - C(t_i, p^0)] & \text{if} \quad p^1 \geq p^0 \\ 2\,B(t_i, p^1) - 2\,C(t_i, p^1) - \lambda\,[B(t_i, p^1) - B(t_i, p^0)] & \text{if} \quad p^1 < p^0 \end{cases}$$

Therefore

$$p_i^1 \ \text{ solves } \begin{cases} B_p(t_i, p^1) - (1 + \frac{\lambda}{2})C_p(t_i, p^1) = 0 & \text{s.t.} \quad p^1 > p^0 \\ p^1 = p^0 & \text{otherwise} \\ (1 + \frac{\lambda}{2})B_p(t_i, p^1) - C_p(t_i, p^1) = 0 & \text{s.t.} \quad p^1 < p^0 \end{cases}$$

and $p_i^2 = p_i^1$

this proves that a young voter i sets her ideal policy "as if" her perceived loss aversion was $\frac{\lambda}{2}$. Thus $\lambda^y = \lambda/2$. This result can easily be extended to the case in which a voter's residual life consists in n periods. In this case, her perceived loss aversion is λ/n. By $\lambda/2 = \lambda^y < \lambda^o = \lambda$ and by (23), it follows that $\hat{t}^o > \hat{t}^y$ and $\check{t}^y > \check{t}^o$. Thus the mass of young voters who want the status quo $(F(\hat{t}^y) - F(\check{t}^y))$ is smaller than the mass of old voters who want the status quo $(F(\hat{t}^o) - F(\check{t}^o))$.

ii) Consider the inequality in (8). The first term is the percentage of old voters blocking an increase in the policy, where $1 - \sigma$ is the old voters' share in the population and $\hat{t}^o$ is the highest old blocking type. The second term, $\sigma F(\hat{t}^y)$, is the percentage of young blocking voters in the entire population. If these two blocking groups represent less than 50% of the population, the inequality in (8) is satisfied. The majority will choose a *higher* policy than the status quo. Condition (9), says that a *lower* policy will pass if those who prefer the status quo or any higher policy are less than a half of the population. Of course the two conditions are mutually exclusive (i.e. if there is a majority willing to increase the policy there cannot be a majority willing to decrease it). If neither of the two conditions is satisfied, then the status quo remains.

iii) Since $\hat{t}^o > \hat{t}^y$, then $F(\hat{t}^o) > F(\hat{t}^y)$. By (6-7), the term in the LHS of (8), $(1 - S(b))F(\hat{t}^o) + S(b)F(\hat{t}^y)$, is decreasing in b. Thus, the lower b, the smaller the set of parameter values for which a constituency in favor of $p > p^S$ exists. Following the same steps, also the term in the LHS of (9) is decreasing in b. Thus, the lower b, the smaller the set of parameter values for which (9) is satisfied. Summing up, with a lower birth rate, a constituency for a policy reform is less likely to form.

iv) Suppose in a given period k a constituency for a reform exists. For instance, a shock in preferences/distribution/birth rate is such that either condition (8) or (9) is satisfied. We prove here that the reform will be more different from the status quo the more numerous are the young. The equations that pin down the equilibrium policy p are:

$$\text{if (8) holds, } p > p^S \text{ solves: } \quad (1-\sigma)F(H^{-1o}(p)) + \sigma F(H^{-1y}(p)) = 0.5 \tag{25}$$

$$\text{if (9) holds, } p < p^S \text{ solves: } \quad (1-\sigma)(1 - F(H^{-1o}(p))) + \sigma(1 - F(H^{-1y}(p))) = 0.5 \tag{26}$$

$$\text{if neither (8) nor (9) hold, } \quad p = p^S \tag{27}$$

where $H^{-1o}(p)$ is the inverse function of (5) in the old group (in which perceived loss aversion is $\lambda^o = \lambda$). It yields the type of old voter whose bliss point is p. Thus $F(H^{-1o}(p))$ is the share of old voters who want a lower policy than p. Similarly, $H^{-1y}(p)$ is the inverse function of (5) in the young group (with perceived loss aversion $\lambda^y = \lambda/2$), and $F(H^{-1y}(p))$ is the share of young voters who want a lower policy than p. Note that $H^{-1o}(p)$ and $H^{-1o}(p)$ are not defined at the point $p = p^S$. Equations in (25) and (26) say that the reform is a new policy $p \neq p^S$ such that exactly a half of the population want a lower policy (and the other half want a higher policy). Specifically, the median type is the same in both generations, the young median wants a different policy than the old median. Thus the equilibrium p^k is in between their bliss points, and it is set according to (25)-(26).

If (8) holds, then equation (25) pins down the equilibrium policy $p^k > p^S$. By (6), implicit differentiating (25) w.r.t. b yields

$$\frac{\partial p^k}{\partial b} = -\frac{S_b \cdot \left[F(H^{-1y}(p^k) - F(H^{-1o}(p^k))\right]}{(1-\sigma)f(H^{-1o}(p^k))H_p^{-1o}(p^k) + \sigma f(H^{-1y}(p^k))H_p^{-1y}(p^k)} > 0 \qquad \text{for } p^k > p^S$$

where the inequality follows from the fact that $S_b > 0$ and $F(H^{-1y}(p) < F(H^{-1o}(p))$ for any $p > p^S$, and the denominator is positive since all terms are positive (specifically, by (5) the relations between bliss points and types are strictly positive for young and old, thus their inverses derivatives are positive: $H_p^{-1y}(p), H_p^{-1o}(p) > 0$). Following the same steps, by implicit differentiation of (26) w.r.t. b and taking into account that, for any $p < p^S$, $F(H^{-1y}(p) > F(H^{-1o}(p))$, we have

$$\frac{\partial p^k}{\partial b} = -\frac{S_b \cdot \left[F(H^{-1o}(p^k) - F(H^{-1y}(p^k))\right]}{-(1-\sigma)f(H^{-1o}(p^k))H_p^{-1o}(p^k) - \sigma f(H^{-1y}(p^k))H_p^{-1y}(p^k)} < 0 \qquad \text{for } p^k < p^S$$

Hence, in case of a policy change, the lower b, the lower the distance between the equilibrium policy p^k and the status quo. ■

Proof. Proposition 3

With loss aversion, the two candidates' objective functions are

$$U^l \equiv U(x,l) \cdot P(x,y,p^S) + U(y,l) \cdot \left[1 - P(x,y,p^S)\right] \tag{28}$$

$$U^r \equiv U(x,r) \cdot P(x,y,p^S) + U(y,r) \cdot \left[1 - P(x,y,p^S)\right] \tag{29}$$

where $P(x,y,p^S) \equiv \Pr\left\{T^{LA}(x,y,p^S) > t_m + \epsilon\right\} = \frac{1}{2\delta}(T^{LA}(x,y,p^S) - t_m + \delta)$. Nash equilibrium, $\{x^*, y^*\}$, is found by simultaneously solving the following two FOCs

$$U_x^l = U_x(x,l) \cdot P(x,y,p^S) + [U(x,l) - U(y,l)] \cdot P_x(x,y,p^S) = 0 \tag{30}$$

$$U_y^r = U_y(y,r) \cdot \left[1 - P(x,y,p^S)\right] - [U(y,r) - U(x,r)] \cdot P_y(x,y,p^S) = 0 \tag{31}$$

The two SOCs are satisfied if $U(p,l)$ and $U(p,r)$ are sufficiently concave. For the stability condition, see the proof of Proposition 4 below.

By (16), the loss aversion parameter λ affects the type of the indifferent voter, t_{ind}^{LA}. As t_{ind}^{LA} changes, the candidates' incentive to propose higher or lower platform change accordingly. Thus, we can compare what happens with and without loss aversion if we let the indifferent voter with loss aversion be "sufficiently close" to the indifferent voter with no loss aversion. For simplicity, assume $t_{ind}^{LA} = t_{ind}$ (results below go through if t_{ind}^{LA} and t_{ind} are sufficiently close). By (16-10), $t_{ind}^{LA} = t_{ind}$ implies that $B(t_{ind}^{LA}, p^S) - B(t_{ind}^{LA}, x) = C(t_{ind}^{LA}, y) - C(t_{ind}^{LA}, p^S)$. Thus, $T_x^{LA} = -\frac{V_x(t_{ind}^{LA},x)+\lambda B_x(t_{ind}^{LA},x)}{V_t(t_{ind}^{LA},x)-V_t(t_{ind}^{LA},y)} > T_x = -\frac{V_x(t_{ind},x)}{V_t(t_{ind},x)-V_t(t_{ind},y)}$ and $T_y^{LA} = -\frac{-V_y(t_{ind}^{LA},x)+\lambda C_y(t_{ind}^{LA},y)}{V_t(t_{ind}^{LA},x)-V_t(t_{ind}^{LA},y)} > T_y = -\frac{-V_y(t_{ind}^{LA},x)}{V_t(t_{ind},x)-V_t(t_{ind},y)}$. This implies that, for any x and y, $P_x(x,y,p^S) > P_x(x,y)$ and $P_y(x,y,p^S) > P_y(x,y)$; i.e. under loss aversion a marginal change in a candidate's platform has a bigger impact on his winning probability. Note that $t_{ind}^{LA} = t_{ind}$ also implies that $P(x,y,p^S) = P(x,y)$. The two equilibrium strategies with no loss aversion solve (14-15), but they cannot solve (30-31). Specifically, at the equilibrium point with no loss aversion, the LHS of (30) is strictly positive, and the LHS of (31) is strictly negative. This implies that, with loss aversion, the left-wing candidate has incentive to propose a higher platform than with no loss aversion, while the right-wing candidate has incentive to propose a lower platform. Now we complete the proof by showing that the equilibrium with loss aversion implies more similar platforms.

Let (x^{*1}, y^{*1}) be the equilibrium with no loss aversion, and (x^{*2}, y^{*2}) the equilibrium with loss aversion. Assume by contradiction that the latter entails less convergence: $x^{*2} < x^{*1} < y^{*1} < y^{*2}$. The assumption of sufficiently high concavity yields $U^l_{xy}, U^r_{yx} \geq 0$. Therefore $U^l_x(x^{*2}, y^{*2}) \geq U^l_x(x^{*2}, y^{*1}) > U^l_x(x^{*1}, y^{*1}) > 0$ where the first inequality follows from $U^l_{xy} \geq 0$ and the second one follows from $U^l_{xx} < 0$. Hence, at the point (x^{*1}, y^{*1}) candidate l has incentive to increase his platform. This yields a contradiction. Finally, assume $x^{*2} < x^{*1} < y^{*2} < y^{*1}$. In such a case, $t^{LA}_{ind} < t_{ind}$, violating the hypothesis. Therefore, by contradiction, with loss aversion equilibrium platforms are more similar.

Special cases.

We consider now how equilibrium is affected by loss aversion when both equilibrium platforms are either above or below the status quo. We will prove that in these cases the equilibrium platforms unaffected by changes in the status quo, but they are closer to the status quo, than with no loss aversion.

Case 1: both platforms are below the status quo

If $\{x, y\} \in [0, p^S]^2$, the indifference condition that pins down the indifferent type, t^{LA}_{ind}, is

$$V(t^{LA}_{ind}, x) - \lambda \left[B(t^{LA}_{ind}, p^S) - B(t^{LA}_{ind}, x)\right] = V(t^{LA}_{ind}, y) - \lambda \left[B(t^{LA}_{ind}, p^S) - B(t^{LA}_{ind}, y)\right]$$

which simplifies into

$$V(t^{LA}_{ind}, x) + \lambda \left[B(t^{LA}_{ind}, x)\right] = V(t^{LA}_{ind}, y) + \lambda \left[B(t^{LA}_{ind}, y)\right]. \tag{32}$$

As a result $t_{ind}^{LA} = T^{LA}(x, y)$ is independent of the status quo. Thus also the probability that candidate left wins $P(x, y) = \frac{1}{2\delta}(T^{LA}(x, y) - t_m + \delta)$ does not depend of p^S. Hence, equilibrium platforms are independent of the status quo, $\frac{\partial x^*}{\partial p^S} = 0$, $\frac{\partial y^*}{\partial p^S} = 0$.

Now we prove that loss aversion implies that both equilibrium platforms are closer to the status quo. Implicit differentiation of (32) yields

$$T_\lambda = \frac{B((t_{ind}^{LA}, x) - B(t_{ind}^{LA}, y)}{V_t(t_{ind}^{LA}, y) - V_t(t_{ind}^{LA}, x) + \lambda[B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)]} < 0.$$

This means that, for any $\{x, y\} \in [0, p^S]^2$ we have that $T^{LA}(x, y) < T(x, y)$. This implies that given an equilibrium with no loss aversion (x^1, y^1), if there exists a parameter λ such that the equilibrium with loss aversion (x^*, y^*) is such that $T^{LA}(x^*, y^*) = T(x^1, y^1)$, then $(x^*, y^*) \neq (x^1, y^1)$. Moreover, it must be the case that $x^1 < x^* < y^1 < y^*$, i.e. the policies with loss aversion are closer to the Status Quo p^S. Notice that

$$T_x^{LA} = \frac{V_x(t_{ind}^{LA}, x) + \lambda B_x(t_{ind}^{LA}, x)}{V_t(t_{ind}^{LA}, y) - V_t(t_{ind}^{LA}, x) + \lambda[B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)]} =$$

$$= \frac{(1+\lambda)B_x(t_{ind}^{LA}, x) - C_x(t_{ind}^{LA}, x)}{(1+\lambda)[B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)] - [C_t(t_{ind}^{LA}, y) - C_t(t_{ind}^{LA}, x)]} >$$

$$> \frac{B_x(t_{ind}^{LA}, x) - C_x(t_{ind}^{LA}, x)}{[B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)] - [C_t(t_{ind}^{LA}, y) - C_t(t_{ind}^{LA}, x)]} =$$

$$= \frac{V_x(t_{ind}^{LA}, x)}{V_t(t_{ind}^{LA}, y) - V_t(t_{ind}^{LA}, x)} = T_x$$

Moreover:

$$T_y^{LA} = -\frac{V_y(t_{ind}^{LA}, y) + \lambda B_y(t_{ind}^{LA}, y)}{V_t(y, t_{ind}^{LA}) - V_t(x, t_{ind}^{LA}) + \lambda[B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)]} =$$

$$= \frac{C_y(t_{ind}^{LA}, x) - (1+\lambda)B_y(t_{ind}^{LA}, x)}{(1+\lambda)[B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)] - [C_t(t_{ind}^{LA}, y) - C_t(t_{ind}^{LA}, x)]} <$$

$$< \frac{C_y(t_{ind}^{LA}, x) - B_y(t_{ind}^{LA}, x)}{[B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)] - [C_t(t_{ind}^{LA}, y) - C_t(t_{ind}^{LA}, x)]} =$$

$$= -\frac{V_y(t_{ind}^{LA}, y)}{V_t(t_{ind}^{LA}, y) - V_t(t_{ind}^{LA}, x)} = T_y.$$

Where T_x and T_y are the derivatives of the indifferent type with no loss aversion.

Let $a,\ b,\ c,\ d$ be positive numbers such that $\frac{a-b}{c+d} > 0$. Take $k > 1$. Then $\frac{ka-b}{kc+d} > \frac{ka-kb}{kc+kd} > \frac{a-b}{c+d}$: which implies the first inequality $T_x^{LA} > T_x$. Moreover $\frac{a-kb}{kc+d} < \frac{a-b}{c+d}$ implies the second inequality $T_y^{LA} < T_y$.

To see this, set $a = B_x(t_{ind}^{LA}, x);\ b = C_x(t_{ind}^{LA}, x);\ c = [B_t(t_{ind}^{LA}, y) - B_t(t_{ind}^{LA}, x)];\ d = -[C_t(t_{ind}^{LA}, y) - C_t(t_{ind}^{LA}, x)]$;and $k = (1+\lambda)$ for the first inequality; set $a = C_y(t_{ind}^{LA}, x)$ and $b = B_y(t_{ind}^{LA}, x)$ for the second inequality.

The two inequalities above imply that, for any x and y, and any $\lambda > 0$, $P_x(x, y) < P_x(x, y, \lambda)$, and $P_y(x, y, \lambda) < P_y(x, y)$. We already know that, if $t_{ind}^{LA} = t_{ind}$, the equilibrium with no loss aversion (x^1, y^1) is different from the equilibrium under loss aversion (x^*, y^*). Moreover, it does not satisfy the FOCs with loss aversion, because $P_x(x^1, y^1, \lambda) > P_x(x^1, y^1)$ and $P_y(x^1, y^1, \lambda) < P_y(x^1, y^1)$. Specifically: $0 = U_x^l(x^1, y^1) < U_x^l(x^1, y^1, \lambda)$ and $0 = U_y^r(x^1, y^1) < U_y^r(x^1, y^1, \lambda)$. Thanks to the enough concavity assumption of U that is invoked throughout the discussion: $U_{xy}^l > 0$, $U_{yx}^r > 0$, and $U_{xx}^l < 0$, $U_{yy}^r < 0$.

Now, suppose the equilibrium is such that $x^* < x^1 < y^1 < y^*$. Thus $0 < U_x^l(x^1, y^1, \lambda)$

$< U_x^l(x^1, y^*, \lambda) < U_x^l(x^*, y^*, \lambda)$ where the first inequality comes from $U_{xy}^l > 0$ and the second from $U_{xx}^l < 0$. So this one cannot be an equilibrium. Next, $x^1 < x^* < y^* < y^1$. Then $0 < U_y^r(x^1, y^1, \lambda) < U_y^r(x^*, y^1, \lambda) < U_y^r(x^*, y^*, \lambda)$ where the first inequality comes from $U_{xy}^r > 0$ and the second from $U_{yy}^r < 0$.Thus, it cannot be an equilibrium either. Finally, suppose $x^* < x^1 < y^* < y^1$: in such a case $t_{ind}^{LA} \neq t_{ind}$ in contradiction with the hypothesis. Therefore, any equilibrium (x^*, y^*) where $T^{LA}(x^*, y^*, \lambda) = T(x^1, y^1)$, must be such that $x^1 < x^* < y^1 < y^*$. This proves that with loss aversion both equilibrium platforms are closer to the status quo, than with no loss aversion.

Case 2: both platforms are above the status quo

If $\{x, y\} \in [0, p^S]^2$, the indifference condition that pins down the indifferent type, t_{ind}^{LA}, is

$$V(t_{ind}^{LA}, x) - \lambda \left[C(t_{ind}^{LA}, x) - C(t_{ind}^{LA}, p^S)\right] = V(t_{ind}^{LA}, y) - \lambda \left[C(t_{ind}^{LA}, y) - C(t_{ind}^{LA}, p^S)\right]$$

which simplifies into

$$V(t_{ind}^{LA}, x) - \lambda \left[C(t_{ind}^{LA}, x)\right] = V(t_{ind}^{LA}, y) - \lambda \left[C(t_{ind}^{LA}, y)\right]. \tag{33}$$

Following the same steps as in Case 1 above, $\frac{\partial x^*}{\partial p^S} = 0$, $\frac{\partial y^*}{\partial p^S} = 0$.

Implicit differentiation of 33 yields

$$T_\lambda = \frac{C((t_{ind}^{LA}, y) - C(t_{ind}^{LA}, x)}{V_t(t_{ind}^{LA}, y) - V_t(t_{ind}^{LA}, x) - \lambda[C_t(t_{ind}^{LA}, y) - C_t(t_{ind}^{LA}, x)]} > 0.$$

following the same steps as above, we can show that $x^* < x^1 < y^* < y^1$, i.e. the policies under loss aversion are closer to the Status Quo p^S :

$$T_x^{LA}(x,y,\lambda) = \frac{V_x(t_{ind}^{LA},x) - \lambda C_x(t_{ind}^{LA},x)}{V_t(t_{ind}^{LA},y) - V_t(t_{ind}^{LA},x) - \lambda[C_t(t_{ind}^{LA},y) - C_t(t_{ind}^{LA},x)]} =$$

$$= \frac{B_x(t_{ind}^{LA},x) - (1+\lambda)C_x(t_{ind}^{LA},x)}{[B_t(t_{ind}^{LA},y) - B_t(t_{ind}^{LA},x)] - (1+\lambda)[C_t(t_{ind}^{LA},y) - C_t(t_{ind}^{LA},x)]} <$$

$$< \frac{B_x(t_{ind}^{LA},x) - C_x(t_{ind}^{LA},x)}{[B_t(t_{ind}^{LA},y) - B_t(t_{ind}^{LA},x)] - [C_t(t_{ind}^{LA},y) - C_t(t_{ind}^{LA},x)]} =$$

$$= \frac{V_x(t_{ind}^{LA},x)}{V_t(t_{ind}^{LA},y) - V_t(t_{ind}^{LA},x)} = T_x(x,y)$$

Moreover

$$T_y^{LA}(x,y,\lambda) = -\frac{V_y(t_{ind}^{LA},x) - \lambda C_y(t_{ind}^{LA},x)}{V_t(t_{ind}^{LA},y) - V_t(t_{ind}^{LA},x) - \lambda[C_t(t_{ind}^{LA},y) - C_t(t_{ind}^{LA},x)]} =$$

$$= \frac{(1+\lambda)C_y(t_{ind}^{LA},x) - B_y(t_{ind}^{LA},x)}{[B_t(t_{ind}^{LA},y) - B_t(t_{ind}^{LA},x)] - (1+\lambda)[C_t(t_{ind}^{LA},y) - C_t(t_{ind}^{LA},x)]} >$$

$$> \frac{C_y(t_{ind}^{LA},x) - B_y(t_{ind}^{LA},x)}{[B_t(t_{ind}^{LA},y) - B_t(t_{ind}^{LA},x)] - [C_t(t_{ind}^{LA},y) - C_t(t_{ind}^{LA},x)]} =$$

$$= -\frac{V_y(t_{ind}^{LA},y)}{V_t(t_{ind}^{LA},y) - V_t(t_{ind}^{LA},x)} = T_y(x,y).$$

Using the same argument as in Case 1, $0 = U_x^l(x^1,y^1) > U_x^l(x^1,y^1,\lambda)$ and $0 = U_y^r(x^1,y^1) > U_y^r(x^1,y^1,\lambda)$. Assume $x^1 < x^* < y^* < y^1$. Then $0 > U_x^l(x^1,y^1,\lambda) > U_x^l(x^1,y^*,\lambda) > U_x^l(x^*,y^*,\lambda)$ where the first inequality follows from $U_{xy}^l > 0$ and the second one from $U_{xx}^l < 0$. So, it cannot be an equilibrium.

Now, assume $x^* < x^1 < y^1 < y^*$. We have $0 > U_y^r(x^1,y^1,\lambda) > U_y^r(x^*,y^1,\lambda) > U_y^r(x^*,y^*,\lambda)$ where the first inequality follows from $U_{xy}^r > 0$ and the second one from $U_{yy}^r < 0$. As a result, it is not an equilibrium. Finally, assume $x^1 < x^* <$

$y^1 < y^*$. This implies that $t^{LA}_{ind} \neq t_{ind}$, which is in contradiction with the hypothesis. Therefore, any equilibrium (x^*, y^*) where $T^{LA}(x^*, y^*, \lambda) = T(x^1, y^1)$, must be such that $x^* < x^1 < y^* < y^1$: with loss aversion, equilibrium platforms are closer to the status quo.

Results for Cases 1 and 2 are consistent with the idea presented in the main text that with loss aversion candidates fix their platforms to accommodate voters' attachment to the status quo (moderation effect).

Case 3: core party members are subject to loss aversion

We now show that equilibrium platforms are more similar when core party members are subject to loss aversion. We assume that the candidates' objective functions are the same as the indirect utility functions of their core party members :

$$U(p, l \mid p^S) = \begin{array}{ll} V(p, l) - \lambda \left[B(p^S, l) - B(p, l)\right] & \text{if} \quad p < p^S \\ V(p, l) - \lambda \left[C(p, l) - C(p^S, l)\right] & \text{if} \quad p \geq p^S \end{array} \tag{34}$$

$$U(p, r \mid p^S) = \begin{array}{ll} V(p, r) - \lambda \left[B(p^S, r) - B(p, r)\right] & \text{if} \quad p < p^S \\ V(p, r) - \lambda \left[C(p, r) - C(p^S, r)\right] & \text{if} \quad p \geq p^S \end{array} \tag{35}$$

where the type of the left-wing (right-wing) core party members is l (r, respectively). Let the two parties' ideal policies with loss aversion be $\bar{l}^{LA} < p^S$ and $\bar{r}^{LA} > p^S$. They maximize the two above functions, respectively. With no loss aversion, the two most preferred policies are $\bar{l}$ and $\bar{r}$ which maximize $V(p, l)$ and $V(p, r)$, respectively. It is easy to see that $\bar{l}^{LA} > \bar{l}$ and $\bar{r}^{LA} < \bar{r}$. Let $\tilde{x}^*$ and $\tilde{y}^*$ be the equilibrium platforms when core party members are subject to loss aversion, with $\tilde{x}^* < p^S < \tilde{y}^*$. They solve the following two FOCs

$$U_x^{lLA} = U_x(x, l \mid p^S) \cdot P(x, y, p^S) + \left[U(x, l \mid p^S) - U(y, l \mid p^S)\right] \cdot P_x(x, y, p^S) = 0 \tag{36}$$

$$U_y^{rLA} = U_y(y, r \mid p^S) \cdot \left[1 - P(x, y, p^S)\right] - \left[U(y, r \mid p^S) - U(x, r \mid p^S)\right] \cdot P_y(x, y, p^S) = 0 \tag{37}$$

where $P(x, y, p^S)$ is defined as in the proof of Proposition 4.

We want to show that the equilibrium when core party members are not loss averse cannot be the equilibrium when they are loss averse. Let $\{x^*, y^*\}$ be the equilibrium platforms when core party members are not loss averse. We show that $\{x^*, y^*\}$ solve (30-31) but they do not solve (36-37). If x^* and y^* are sufficiently symmetrical with respect to the status quo, then $\left[U(x^*, l \mid p^S) - U(y^*, l \mid p^S)\right] - [V(x^*, l) - V(y^*, l)]$ and $\left[U(y^*, r \mid p^S) - U(x^*, r \mid p^S)\right] - [V(y^*, r) - V(x^*, r)]$ are sufficiently small. Thus the signs of (36) and (37) are determined by $U_x(x^*, l \mid p^S)$ and $U_y(y^*, r \mid p^S)$, respectively. Since $x^* < p^S$, by (34), $V_x(x, l) < U_x(x, l \mid p^S)$. Since $y^* \in (p^S, \bar{r}^{LA})$, by (35), $U_y(y, r \mid p^S) > V_y(x, l) > 0$. Thus, at the point $\{x^*, y^*\}$ (36) is positive, and (37) is negative. The left-wing candidate has incentive to propose a higher policy and the right-wing has incentive to propose a lower policy. Therefore, the equilibrium when core party members are not loss averse cannot be an equilibrium when they are loss averse. The equilibrium policies are more convergent when core party members are loss averse. ■

Proof. Proposition 4

i) By (30-31), $x^* = X^{LA}(p^S)$ and $y^* = Y^{LA}(p^S)$. We can derive comparative statics by solving for the derivatives of X^{LA} and X^{LA}:

$$\frac{\partial x^*}{\partial p^S} = \frac{\begin{vmatrix} -U^l_{xp^S} & U^l_{xy} \\ -U^r_{yp^S} & U^r_{yy} \end{vmatrix}}{|A|} \tag{38}$$

$$\frac{\partial y^*}{\partial p^S} = \frac{\begin{vmatrix} U^l_{xx} & -U^l_{xp^S} \\ U^r_{yx} & -U^r_{yp^S} \end{vmatrix}}{|A|}$$

where $|A| = U^l_{xx}U^r_{yy} - U^l_{xy}U^r_{yx} > 0$ is the standard regularity condition which ensures stability at the equilibrium point. We show below that it is satisfied if $U(p,l)$ and $U(p,r)$ are sufficiently concave. Since $|A| > 0$, the sign of $\frac{\partial x^*}{\partial p^S}$ is the same as the sign of $-U^l_{xp^S}U^r_{yy} + U^l_{xy}U^r_{yp^S}$. The sign of $\frac{\partial y^*}{\partial p^S}$, it is the same as the sign of $-U^r_{yp^S}U^l_{xx} + U^r_{yx}U^l_{xp^S}$. By U^l_x and U^r_y defined in (30-31),

$$U^l_{xx} = U_{xx}(x,l) \cdot P + 2U_x(x,l) \cdot P_x + [U(x,l) - U(y,l)] \cdot P_{xx} \tag{39}$$

$$U^r_{yy} = U_{yy}(y,r) \cdot [1-P] - 2P_y \cdot U_y(y,r) + [U(x,r) - U(y,r)] \cdot P_{yy} \tag{40}$$

$$U^l_{xy} = U_x(x,l) \cdot P_y - U_y(y,l) \cdot P_x + [U(x,l) - U(y,l)]\, P_{xy} \tag{41}$$

$$U^r_{yx} = -U_y(y,r) \cdot P_x + U_x(x,r) \cdot P_y + [U(x,r) - U(y,r)] \cdot P_{yx} \tag{42}$$

$$U^l_{xp^S} = U_x(x,l) \cdot P_{p^S} + [U(x,l) - U(y,l)] \cdot P_{xp^S} \tag{43}$$

$$U^r_{yp^S} = -U_y(y,r) \cdot P_{p^S} + [U(x,r) - U(y,r)] \cdot P_{yp^S} \tag{44}$$

In order to determine the signs of (39-44), we need to study the derivatives of the winning probability function, $P(x,y,p^S)$.

By implicit differentiation of (16),

$$T_{p^S}^{LA} = \frac{\partial t_{ind}^{LA}}{\partial p^S} = -\frac{-\lambda\left[B_p(t_{ind}^{LA}, p^S) + C_p(t_{ind}^{LA}, p^S)\right]}{M} < 0 \tag{45}$$

where $M < 0$ and it is defined by

$$\begin{aligned} M \equiv\ & V_t(t_{ind}^{LA}, x) - V_t(t_{ind}^{LA}, y) - \\ & \lambda\left[B_t(t_{ind}^{LA}, p^S) - B_t(t_{ind}^{LA}, x)\right] + \\ & \lambda\left[C_t(t_{ind}^{LA}, y) - C_t(t_{ind}^{LA}, p^S)\right] \end{aligned}$$

The inequality $M < 0$ follows from the fact that a marginally higher type than t_{ind}^{LA} prefers y more than x.

Following the same steps, $T_x^{LA} = -\frac{V_x(t_{ind}^{LA},x)+\lambda B_x(t_{ind}^{LA},x)}{M} > 0$ and $T_y^{LA} = -\frac{-V_y(t_{ind}^{LA},y)+\lambda C_y(t_{ind}^{LA},y)}{M} > 0$.

Therefore, $P_x = \frac{1}{2\delta}T_x^{LA} > 0$, $P_y = \frac{1}{2\delta}T_y^{LA} > 0$, and $P_{p^S} = \frac{1}{2\delta}T_{p^S}^{LA} < 0$ (by (45)).

As for second order derivatives, signs are ambiguous:

$T_{xx}^{LA} = -\frac{(V_{xx}+\lambda B_{xx}+(V_{tx}+\lambda B_{tx})T_x^{LA})M-(V_x+\lambda B_x)(V_{tx}+\lambda B_{tx}+M_t T_x^{LA})}{M^2} \lesseqgtr 0$;

similarly, $T_{yy}^{LA}, T_{xy}^{LA} \lesseqgtr 0$. Moreover,

$$T_{xp^S}^{LA} = -\frac{\left[V_{xt} + \lambda B_{xt}\right] T_{p^S}^{LA} M - (V_x + \lambda B_x)\lambda(-B_{tp^S} - C_{tp^S} + M_t T_{p^S}^{LA})}{M^2} \lesseqgtr 0 \tag{46}$$

and $T_{yp^S}^{LA} \lesseqgtr 0$. Therefore $P_{xx} = \frac{1}{2\delta}T_{xx}^{LA} \lesseqgtr 0$, and $P_{yy}, P_{xp^S}, P_{yp^S}, P_{yx} \lesseqgtr 0$.

By (39-40), if function $U(p, .)$ is sufficiently steep and concave in the policy p, then $U_{xx}^l, U_{yy}^r < 0$. Moreover, by (41-42), enough concavity also ensures $U_{xy}^l, U_{yx}^r > 0$. Therefore, the stability condition $|A| > 0$ is satisfied. Note that if $\lambda = 0$, this model coincides with the model in subsection (5.1). Also in that model a sufficient degree of concavity of $U(p,.)$ ensures that the standard regularity condition is satisfied. By (43, 44), if $|U_x(x,l)|$ and $|-U_y(y,r)|$ are large enough, then $U^l_{xp^S}, U^r_{yp^S} > 0$, irrespective of the sign of P_{xp^S} and P_{yp^S}. Since $U^l_{xx}, U^r_{yy} < 0$ and $U^r_{yx}, U^l_{xy} > 0$, then $-U^l_{xp^S}U^r_{yy} + U^l_{xy}U^r_{yp^S} > 0$ and $-U^r_{yp^S}U^l_{xx} + U^r_{yx}U^l_{xp^S} > 0$. Hence, $\frac{\partial x^*}{\partial p^S}, \frac{\partial y^*}{\partial p^S} > 0$: equilibrium platforms are increasing in the status quo. Finally, observe that by (46), if $|B_{xt}|$ and $|C_{xt}|$ are sufficiently small, then $\left|P_{xp^S}\right| = \frac{1}{2\delta}\left|T^{LA}_{xp^S}\right|$ is small and, similarly, $\left|P_{yp^S}\right|$ is small. In this case, a larger set of parameters would ensure $U^l_{xp^S}, U^r_{yp^S} > 0$. The reason is that small values of $|B_{pt}|$ and $|C_{pt}|$ imply that a change in the status quo does not have a strong effect on the number of voters that candidates can affect by changing their platforms at the margin. Thus both candidates have strong incentive to move their platforms in the same direction as the status quo.

ii) The expected equilibrium policy outcome is $\boldsymbol{E}(p^*, p^S) = x^* \cdot P(x^*, y^*, p^S) + y^* \cdot (1 - P(x^*, y^*, p^S))$, where

$$P(x^*, y^*, p^S) = \frac{1}{2\delta}\left[T^{LA}(x^*, y^*, p^S) - t_m + \delta\right] \tag{47}$$

and $x^* = X^{LA}(p^S)$ and $y^* = Y^{LA}(p^S)$, with $\frac{\partial x^*}{\partial p^S}, \frac{\partial y^*}{\partial p^S} > 0$. Differentiating $\boldsymbol{E}(p^*, p^S)$ w.r.t. p^S yields,

$$\frac{\partial \boldsymbol{E}(p^*, p^S)}{\partial p^S} = \frac{\partial x^*}{\partial p^S} \cdot P + \frac{\partial y^*}{\partial p^S} \cdot (1 - P) + \frac{\partial P}{\partial p^S} \cdot (x^* - y^*)$$

where $\frac{\partial P}{\partial p^S} = \frac{1}{2\delta}\left[T^{LA}_{p^S} + T^{LA}_x \frac{\partial x^*}{\partial p^S} + T^{LA}_y \frac{\partial y^*}{\partial p^S}\right]$. We want to show that $\frac{\partial \boldsymbol{E}(p^*, p^S)}{\partial p^S} > 0$. By statement *i)* in this proposition, the first two terms are positive. The sign of the last term is ambiguous, because $T^{LA}_{p^S} < 0$ and $T^{LA}_x, T^{LA}_y > 0$ (cf. proof of statement *i)* above). Thus $\frac{\partial P}{\partial p^S} \cdot (x^* - y^*) = \frac{1}{2\delta}\left[T^{LA}_{p^S} + T^{LA}_x \frac{\partial x^*}{\partial p^S} + T^{LA}_y \frac{\partial y^*}{\partial p^S}\right] \cdot (x^* - y^*) \lesseqgtr 0$. However, by Proposition 3, equilibrium platforms converge under loss aversion. Hence, if λ is sufficiently large, $|x^* - y^*|$ is small enough, so that the sign of $\frac{\partial \boldsymbol{E}(p^*,p^S)}{\partial p^S}$ is determined by the sign of the first two terms. Thus $\frac{\partial \boldsymbol{E}(p^*,p^S)}{\partial p^S} > 0$. Note that large enough steepness and concavity of the candidates' utility functions is a sufficient condition to show that $\frac{\partial \boldsymbol{E}(p^*,p^S)}{\partial p^S} > 0$. It is perfectly plausible that this derivative is positive despite $\frac{\partial x^*}{\partial p^S}$ and $\frac{\partial y^*}{\partial p^S}$ have opposite signs. Supplementary Material available from the authors includes two parametric examples, one of which showing that expected policy is positively related to status quo, while $\frac{\partial x^*}{\partial p^S} < 0$ and $\frac{\partial y^*}{\partial p^S} > 0$. ∎

Proof. Proposition 5

As mentioned earlier, the expected policy outcome is defined as $\boldsymbol{E}(p^{*2}, p^1) = x^{*2} \cdot P(x^{*2}, y^{*2}, p^1) + y^{*2} \cdot (1 - P(x^{*2}, y^{*2}, p^1))$. The status quo in period 2 is the winner's equilibrium platform in period 1: $p^1 \in \{x^{*1}, y^{*1}\}$, with $x^{*1} < y^{*1}$. By Proposition 4, there is a positive relationship between expected policy and status quo. Thus, $\boldsymbol{E}(p^{*2}, x^{*1}) < \boldsymbol{E}(p^{*2}, y^{*1})$. ∎

Proof. Proposition 6

Let $\{x^{01}, y^{01}\}$ be the equilibrium of the static model, where both candidates maximize their expected utility in period 1 only. We want to show that the FOCs for the equilibrium in the dynamic model are not satisfied at $\{x^{01}, y^{01}\}$. Consider candidate l. We show that enough concavity of $U(p, l)$ ensures that the LHS of (21) is positive at the point $\{x^{01}, y^{01}\}$. By (30-31), the first term of (21) is zero by definition. The second term is positive because $P^1_{x1} > 0$ and by Proposition 4 $U^{2l}(.., x^1) > U^{2l}(.., y^1)$. This term is large if concavity of $U(p, l)$ is high. As for the third term, recall that the winning probability in the second period depends on equilibrium policies and the second period status quo, $P^2 = P^2(x^{*2}, Y^2(x^1), x^1)$. Thus, by (28), and by the envelope theorem, the third term is

$$P^1 \cdot U^{2l}_{x1}(.,x^1) = P^1 \cdot \left\{ \left[U(x^{*2},l) - U(Y^2(x^1),l)\right] \left[P^2_{y2}Y^2_{x1} + P^2_{x1}\right] + U_{y2}(y^2,l) \cdot \left[1-P^2\right] Y^2_{x1} \right\}$$

The above expression characterizes a trade-off about the policy outcome in period 2. On the one hand, a marginal increase in x^1 yields a higher y^{*2}, which in turn raises the left-wing candidate's chance to win also in the second period ($P^2_{y2}Y^2_{x1} > 0$). On the other hand, holding x^{*2} and y^{*2} constant, a marginal increase in the status quo, x^1, lowers the left-wing candidate's probability to win in period 2 ($P^2_{x1} < 0$). Moreover, in the case the left-wing candidate is defeated in period 2, a higher y^{*2} implies a lower utility in the second period. Summing up, the third term of (21) can be either positive or negative. A sufficiently high concavity of $U(p,l)$ ensures that the second term of (21) is large enough, making entire expression (21) positive at the point $\{x^{01}, y^{01}\}$.

Following the same steps, expression (22) is strictly negative at the point $\{x^{01}, y^{01}\}$.

■