Appendix (Supplementary Information): A Signaling Model of Autocratic Expropriation

A simple signaling model demonstrates the existence of a pooling equilibrium, in which loyal dictators cannot differentiate themselves from unloyal ones due to the high costs of expropriation, and a separating equilibrium, in which as the costs of expropriation for a loyal dictator decline relative to the payoffs received from it, he expropriates the PE and thus distinguishes himself from an unloyal dictator. The game is visually depicted in Figure 1 below.

Consider a dynamic game played between a dictator D and his LO. Whether the dictator is an unloyal type $D^{\sim L}$ unwilling to share rents and rely solely on his LO for support in office or a loyal type D^{L} willing to turn against the PE is known to a dictator but not his LO. Common priors on Nature's actions, however, imply that the LO knows the likelihood μ that the dictator they put into power is an unloyal rather than a loyal type. Upon assuming office, the dictator can choose whether or not to expropriate the PE. If the LO observes the dictator choose not to expropriate the PE, it is in the first information set, whereas if the LO observes the dictator expropriate the PE, it is in the second information set.

The LO's beliefs are conditional on the distribution of nature's choice regarding the dictator's type, together with the belief that the LO holds about the strategy that the dictator is playing. The LO updates its beliefs about the dictator's type using Bayes' Rule. For example, suppose that the dictator is using a mixed strategy, where type *L* chooses not to expropriate (~E), with probability, σ^{L} and type ~*L* chooses to expropriate (E), with probability $\sigma^{\sim L}$. If both σ^{L} and $\sigma^{\sim L}$ are between 0 and 1, to find beliefs for the LO's information sets the LO performs the following calculation:

$$\mu_{\sim E} = p\,\sigma^{L}/\sigma^{L} + (1 - p)\,\sigma^{\sim L}$$

and

$$\mu_{E} = p(1 - \sigma^{L})/(1 - \sigma^{L})/\mathrm{p}(1 - \sigma^{L}) + (1- p)(1 - \sigma^{\sim L})$$

The payoffs from expropriation are as follows. If the dictator expropriates from the PE, he takes all their wealth and generates some level of rents $r \in [0,1]$ that is announced to the LO. A higher level of rents benefits D but is worse for LO. Let D's utility function be $u_D(r) = r$, and LO's utility function be $u_{LO}(r) = 1 - r$. If D chooses to expropriate, he also suffers a cost that corresponds to his type. An unloyal dictator has higher costs of expropriation than a loyal dictator since he does not want to solely rely on the LO, and both types have non-zero costs, so that $c_{\sim L} > c_L > 0$. Once D chooses his level of rents, LO may either accept or reject this offer. If LO accepts the offer from $D^{\sim L}$, it suffers an additional cost c_1 relative to the offer of D^{L} for living with an unloyal dictator. If LO rejects the offer of the dictator, then it mounts a coup with cost c that succeeds with probability p. If LO rejects the offer from D^{L}, it suffers an additional cost c_1 relative to its payoff for rejecting $D^{\sim L}$ because it would prefer to live with a loyal dictator relative to an unloyal one.

If the dictator does not expropriate the PE, he still extracts some rents from them, with the residual wealth remaining in the hands of the PE rather than redistributed to the LO. It is assumed, for simplicity, that the level of rents that $D^{\sim L}$ chooses in the case of no expropriation is the same as that after expropriation, and that he shares nothing with LO. D^{L}, by contrast, shares these rents equally with LO. Once D chooses his level of rents, LO can accept or reject the offer. If LO rejects the offer, it again mounts a coup with cost c that succeeds with probability p. If LO wins, it allocates all the wealth to itself. But if it loses, it still gains the residual rents left from the dictator.

There are a number of possible equilibria that obtain for different ranges of the variables, but the existence of two particular equilibria are of interest. The first is a pooling perfect Bayesian equilibrium (PBE) in which both $D^{\sim L}$ and D^{L} choose not to expropriate the PE. In this case, LO gains no information when D does not expropriate, and beliefs about the likelihood that D is unloyal, μ_1, is equal to μ. If LO has off the equilibrium path beliefs μ_2 about the likelihood that D is unloyal if he expropriates such that $\mu_2 > [c + c_1 - p(c_1 + r)]/c_1$, and if the costs of an overthrow attempt satisfy

$c < p - [pr(1-\mu)]/2$, then LO will reject the dictator's offer whether he chooses to expropriate or not. The cost constraint for $D^{\sim L}$ trivially implies that he will not want to deviate from this equilibrium. And when the costs of expropriation to D^{L} are sufficiently high, where $c_L > r/2$, then he too will not deviate. Finally, as the probability of coup success increases relative to the costs of expropriation, $D^{\sim L}$ can also be induced to expropriate, mimicking the behavior of the loyal dictators and negating the signaling value of expropriation.

The second equilibrium of interest is a separating PBE in which $D^{\sim L}$ chooses to not expropriate and D^{L} chooses to expropriate. In this equilibrium, the act of expropriation of the PE will enable the LO to discern that the dictator relies upon them rather than the PE for political support, so that $\mu_1 = 1$ and $\mu_2 = 0$. LO will reject the offer from $D^{\sim L}$ and accept the offer from D^{L} when $p > c > p(c_1 + r) - c_1$. $D^{\sim L}$ will not want to deviate from this equilibrium when his costs of expropriation are sufficiently high such that $c_{\sim L} > rp$, and D^{L} will not deviate provided that his costs of expropriation remain sufficiently low, where $c_L < (r/2)(1-p)$.

Figure 1. Model of Expropriation Choices for Dictators