Online Appendix For

The Politics of Mass Killing in Autocratic Regimes

Contents

This appendix proceeds in five parts. In the first part we report summary statistics of all the variables used for analysis. This appendix continues with a brief technical description of the formal model, and sets the utility functions and sequence of moves. All formal model proofs are then reported in the third part. Finally, in the forth and fifth parts, we list all the sources used to code within-country data for our case studies of Pakistan and Indonesia.

Descriptive Statistics

Table A1: Summary Statistics for Dependent and Independent Variables, 1996-2008

	Median	**Mean**	**Std. Dev.**	**Min**	**Max**
Cell level indicators					
$Killing\ Campaigns_t$	0	0.0004	0.020	0	1
$Killing\ Campaigns_{t-1}$	0	0.0004	0.020	0	1
Urban	0	0.159	0.988	0	1
$Urban\ Development_t$	0	0.474	2.188	0	58.37
$Urban\ Development\ PC_t$	0	0.039	0.170	0	4.944
$Drought_t$	0	0.008	0.087	0	1
GCP_t[1]	0.067	0.358	0.634	0	5.995
$Population_t$[1]	8.449	8.198	3.042	0	16.519
Border Distance[1]	5.743	5.595	1.433	0	9.305
Travel Time[1]	6.340	6.439	1.110	0	10.310
Capital Distance[1]	7.117	7.091	1.106	1.609	8.870
$Conflict_t$	0	0.063	0.243	0	1
Country level indicators					
$Food\ Crisis\ (Volatility)_t$	0	0.039	0.193	0	1
$Drought\ (Count.)_t$	0	0.033	0.178	0	1
$Violent\ Civil\ Disobedience_{t-1}$	0	0.429	0.495	0	1
$Polity2_t$	3	-0.324	5.490	-10	9
$GDP\ PC_t$[1]	8.917	8.566	0.973	5.298	11.084
Oil_t[1]	19.007	16.612	5.845	0	19.980
Gas_t[1]	6.103	5.522	3.055	0	8.424

[1] Natural log.

Brief Technical Description of Model

Players, Utility Functions, Sequence of Moves

Consider the following two groups in an autocratic polity: the authoritarian ruling elite, R; and the civilians, C (which includes workers, i.e. labor), where each civilian c is drawn from $c \in \{1, 2, 3...C\}$. In this autocratic economy, the production of food comes from the Constant Elasticity of Substitution (CES) production function $F(N, L) = [\phi(\alpha N^\rho + (1 - \alpha)L^\rho)^{\frac{\varepsilon}{\rho}}]$, homogeneous of degree ε, which includes two factors of production: agricultural land N and labor L. In this CES production function, $\alpha \in [0, 1]$ is the relative weight of production inputs land N and labor L (who are a part of C); $\rho \leq 1$ is the elasticity of substitution; and ϕ is the "food price shock" parameter (described in Chapter 2) distributed as $U[-1, 1]$ which affects the factors' productivity. The food consumption per capita among the civilians is f_c, where $f_c = \frac{F(N,L)}{C}$, and the ruling elite's food consumption is f_R where $f_R = \frac{F(N,L)}{R}$. R holds control of political power in this autocratic polity. However, the civilians may resort to overt anti-government demonstrations and challenge the ruling elite R to alter the "status quo." If the civilians do not challenge R, they receive a payoff of x_c, given without loss of generality by the following additive function: $x_c = b_c + f_c$. In this function, f_c is each civilian's personal food consumption as defined above, while b_c (which ranges from 0 to a maximum of $\bar{b}_c$) includes the monetary, social and other non-pecuniary benefits that the civilians obtain under the status quo. The ruling elite's payoff under the status quo is $x_R = b_R + f_R$, where f_R is the elite's food consumption and b_R (which rang between 0 and $\bar{b}_R$) includes additional monetary, social and non-pecuniary benefits.

When the civilians C *successfully* mobilize against R (which means that the status quo is altered), the payoff they receive from successfully challenging R and altering the status quo is x_c^Δ, given by $x_c^\Delta = b_c^\Delta + f_c$ where $b_c^\Delta > b_c$. The elite's payoff when the civilians successfully challenge the status quo is $x_R^\Delta = b_R^\Delta + f_c$, where $b_R^\Delta < b_R$. The probability that the civilians openly challenge the ruling elite R is $(1 - q)$, while the probability with which the elite successfully defends against this challenge and remains in power is q. The possibility that the civilians may challenge the regime generates a "political contest" between the elite R and C where the civilians may overtly revolt against R to also obtain political concessions P (this political contest is described in chapter 2 as well). If they resort to a contest against R, then the civilians will collectively allocate resources $h \in [0, \bar{h}]$ to challenge R.

The civilians' ability to devote resources h and collectively mobilize against R is directly influenced by the non-negative parameter θ, which captures the extent of local development and its distribution within urbanized areas. Since h is directly influenced by θ, the total resources devoted by the civilians to challenge the elite is defined as θh. In response to mobilization, the ruling elite R may employ atrocities a (defined here as "killing campaigns") against the civilians as a strategy to prevent them from taking further action. Committing a entails spending resources to target civilians, an additional cost for R, but one that could also help the elite preserve its rule. Recall that q is the probability with which R successfully defends itself against the civilians' challenge and remains in power. Given a and θh, we let q follow the standard "contest success function":

$$q = \frac{a}{a + \theta h} \tag{1}$$

Hence, the probability with which the civilians (the autocratic ruling elite) successfully (fails to) demonstrates against and challenge (defend) R's (their) rule is $(1 - q) = \frac{\theta h}{a+\theta h}$.

When R fails to defend its rule with probability $(1 - q)$ in response to $C's$ challenge, the ruling elite, as mentioned earlier, not only receives the payoff x_R^{Δ}, but may acquiesce and provide concessions P (a cost to R) to C. If, however, R succeeds in deterring the civilians' challenge by employing atrocities a (this entails an additional cost for R) and remains in power with probability q, it receives the payoff x_R. The authoritarian elite's expected utility function is thus

$$U_R = qx_R + (1 - q)(x_R^{\Delta} - P) - a \tag{2}$$

R's optimization problem is to optimally choose a or concessions P to C (provided R acquiesces to $C's$ challenge) so as to maximize U_R subject to $a \geq 0$, $P \geq 0$ and the feasibility constraint $\theta(a + P) \geq \theta(x_R^{\Delta} - x_R)$ (that is, given θ, the costs that R is willing to incur to deter and dissuade the civilians from challenging R has to be lower than the elite's net realized payoff from undertaking such costs). The civilians obtain the following payoffs: x_C when the status quo prevails and R remains in office with probability q, and (ii) x_C^{Δ} and P when they successfully challenge and mobilize to threaten R's rule with probability $1 - q$. Since devoting resources h to confront R entails costs for the civilians, their expected utility function is

$$U_c = qx_c + (1 - q)(x_c^{\Delta} + P) - h \tag{3}$$

The civilians' optimization problem is to choose h to maximize U_C taking P and a into account. The sequence of moves in the model is described in the text of chapter 2.

Proofs

Proof of Lemma 1: $R's$ optimization problem is to maximize U_R in (1) subject to $a \geq 0$, $P \geq 0$ and the feasibility constraint defined as $\theta(a + P) \geq \theta(x_R^{\Delta} - x_R)$ (that is, given θ, the costs that R is willing to incur to deter and dissuade the civilians from challenging R has to be lower than the elite's net realized payoff from undertaking such costs). Using

$q = \frac{a}{a+\theta h}$ and h to replace in U_R, and given the constraints $\theta(a+P) \leq \theta(x_R - x_R^{\Delta})$, $a \geq 0$ and $P \geq 0$, the Lagrangian of $R's$ optimization problem is $\Delta = (x_R^{\Delta} - a) + \frac{a}{\theta(x_c^{\Delta} - x_c - P)}(x_R - x_R^{\Delta} - P) + \mu_1[\theta(x_c^{\Delta} - x_c - P) - a] + \mu_2 a + \mu_3 P$. Because $a \in \Re_+$ a solution to $R's$ maximization problem exists since we have a continuous function on a compact set. When choosing a and P, R accounts for the direct effect of a on q and the indirect effect of a and P on q through h in Δ. Hence, $R's$ choice of a (using Δ) satisfies the following first order condition (f.o.c)

$$\left(\frac{\partial q}{\partial a} + \frac{\partial q}{\partial h}\frac{dh}{da}\right)(x_R - x_R^{\Delta} - P) - 1 - \mu_1 + \mu_2 = 0 \tag{S.1}$$

Using $q = \frac{a}{a+\theta h}$ to compute $\frac{\partial q}{\partial a}$and $\frac{\partial q}{\partial h}$, we can rewrite (S.1) as,

$$\left(\frac{h}{a} - \frac{dh}{da}\right)\frac{(x_R - x_R^{\Delta} - P)}{(x_c^{\Delta} - x_c - P)} - 1 = \mu_1 - \mu_2 \tag{S.2}$$

where

$$\frac{dh}{da} = \left\{ \begin{array}{lr} 0 & \text{for} \quad \theta(a+P) \geq \theta(x_c^{\Delta} - x_c) \\ \sqrt{\frac{x_c^{\Delta} - x_c - P}{\theta a}}\left(\frac{1}{2}\right) - \left(\frac{1}{\theta}\right) & \text{for} \;\; 0 < \theta(a+P) \leq \theta(x_c^{\Delta} - x_c) \end{array} \right\} \tag{S.3}$$

The ruling elite's choice of P satisfies the following f.o.c

$$\left(\frac{\partial q}{\partial h}\frac{\partial h}{\partial P}\right)(x_R - x_R^{\Delta} - P) - q - \mu_1\theta + \mu_3 = 0 \tag{S.4}$$

Likewise, after using $q = \frac{a}{a+\theta h}$ to compute $\frac{\partial q}{\partial h}$, we can rewrite this expression as,

$$-\frac{(x_R - x_R^{\Delta} - P)}{(x_c^{\Delta} - x_c - P)}\frac{\partial h}{\partial P} - q = \theta\mu_1 - \mu_3 \tag{S.5}$$

where

$$\frac{\partial h}{\partial P} = \left\{ \begin{array}{lr} 0 & \text{for} \quad \theta(a+P) \geq \theta(x_c^{\Delta} - x_c) \\ -\frac{a}{\theta(x_c^{\Delta} - x_c - P)}\left(\frac{1}{2}\right) & \text{for} \;\; 0 < \theta(a+P) \leq \theta(x_c^{\Delta} - x_c) \end{array} \right\} \tag{S.6}$$

Additionally, we find that

$$p = \left\{ \begin{array}{lr} 1 & \text{for} \quad \theta(a+P) \geq \theta(x_c^{\Delta} - x_c) \\ \frac{a}{\theta(x_c^{\Delta} - x_c - P)} & \text{for} \;\; 0 < \theta(a+P) \leq \theta(x_c^{\Delta} - x_c) \end{array} \right\} \tag{S.7}$$

From the Lagrangian Δ, the Kuhn-Tucker conditions are as follows

$$\text{For } \mu_1 \geq 0, \quad \frac{\partial \Delta}{\partial \mu_1} = \theta(x_c^{\Delta} - x_c - P) - a \geq 0 \quad \text{and} \quad \mu_1[\theta(x_c^{\Delta} - x_c - P) - a] = 0 \tag{S.8}$$

$$\text{For } \mu_2 \geq 0, \quad \frac{\partial \Delta}{\partial \mu_2} = a \geq 0 \quad \text{and} \quad \mu_2 a = 0 \tag{S.9}$$

$$\text{For } \mu_3 \geq 0, \quad \frac{\partial \Delta}{\partial \mu_3} = P \geq 0 \quad \text{and} \quad \mu_3 P = 0 \tag{S.10}$$

From these Kuhn-Tucker conditions and the Lagrangian Δ, we know that there are six possible cases,

$$\text{Case A.1: } \mu_1 = 0 \text{ and } \theta(x_c^\Delta - x_c - P) - a \geq 0; \;\; \mu_2 \geq 0 \text{ and } a = 0; \;\; \mu_3 \geq 0 \text{ and } P = 0 \tag{S.11}$$

$$\text{Case A.2: } \mu_1 = 0 \text{ and } \theta(x_c^\Delta - x_c - P) - a > 0; \;\; \mu_2 = 0 \text{ and } a > 0; \;\; \mu_3 \geq 0 \text{ and } P = 0 \tag{S.12}$$

$$\text{Case B.1: } \mu_1 = 0 \text{ and } \theta(x_c^\Delta - x_c - P) - a > 0; \;\; \mu_2 \geq 0 \text{ and } a = 0; \;\; \mu_3 = 0 \text{ and } P > 0 \tag{S.13}$$

$$\text{Case B.2: } \mu_1 = 0 \text{ and } \theta(x_c^\Delta - x_c - P) - a > 0; \;\; \mu_2 = 0 \text{ and } a > 0; \;\; \mu_3 = 0 \text{ and } P > 0 \tag{S.14}$$

$$\text{Case C.1: } \mu_1 \geq 0 \text{ and } \theta(x_c^\Delta - x_c - P) - a = 0; \;\; \mu_2 = 0 \text{ and } a > 0; \;\; \mu_3 \geq 0 \text{ and } P = 0 \tag{S.15}$$

$$\text{Case C.2: } \mu_1 \geq 0 \text{ and } \theta(x_c^\Delta - x_c - P) - a = 0; \;\; \mu_2 \geq 0 \text{ and } a = 0; \;\; \mu_3 = 0 \text{ and } P > 0 \tag{S.16}$$

Case A.1 satisfies the f.o.c's in (S.1)-(S.6) for $\frac{(x_R - x_R^\Delta)}{(x_c^\Delta - x_c)} \leq 2$ and $\frac{(x_R - x_R^\Delta)^2}{4\theta(x_c^\Delta - x_c)} \geq k$, while Case A.2 satisfies (S.1)-(S.6) for $\frac{(x_R - x_R^\Delta)}{(x_c^\Delta - x_c)} \leq 2$. Further, the level of a that solves the f.o.c in (S.1) for Case A.2 is $a = \frac{(x_R - x_R^\Delta)^2}{4\theta(x_c^\Delta - x_c)}$. But $U_R^{A.2} > U_R^{A.1}$. To see this, let $k = \frac{(x_R - x_R^\Delta)^2 \phi^2}{4\theta(x_c^\Delta - x_c)}$ with $\phi > 1$. From this expression for k, the conditions for which Case A.1 satisfies the f.o.c's, and after substituting the expression for q in (1) in (S.5), we get $U_R^{A.1} = x_R^\Delta + (1 - \phi/2)\frac{(x_R - x_R^\Delta)^2 \phi}{4\theta(x_c^\Delta - x_c)}$. From the solution of a for Case A.2, and after substituting the expression for q in (1) in (S.5), we obtain $U_r^{A.2} = x_R^\Delta + \frac{(x_R - x_R^\Delta)^2}{4\theta(x_c^\Delta - x_c)}$ which $\Longrightarrow U_R^{A.2} > U_R^{A.1}$ since $(\phi^2 - 1)^2 > 0$. Hence we can rule out <u>Case A.1</u>.

Case B.1 satisfies (S.1)-(S.6) for $\frac{(x_R - x_R^\Delta)}{(x_c^\Delta - x_c)} \leq 2$ and $\frac{(x_R - x_R^\Delta - P)^2}{4\theta(x_c^\Delta - x_c - P)} \geq k$ and P that solves the f.o.c in (S.10) in this case is $P = 2(x_c^\Delta - x_c) - (x_R - x_R^\Delta)$. Case B.2 satisfies (S.7)-(S.13) for $\frac{(x_R - x_R^\Delta)}{(x_c^\Delta - x_c)} \leq 2$ and the level of a that solves (S.7) in this case is $a = \frac{(x_R - x_R^\Delta - P)^2}{4\theta(x_c^\Delta - x_c - P)}$, while P that solves (S.6) in this case is $P = 2(x_c^\Delta - x_c) - (x_R - x_R^\Delta)$. But $U_R^{B.2} > U_R^{B.1}$. Let $k = \frac{(x_R - x_R^\Delta - P)^2 \phi^2}{4\theta(x_c^\Delta - x_c - P)}$ with $\phi > 1$. From this expression for k, the solution for P in Case B.1, the conditions for which Case B.1 satisfies the f.o.c's, and after substituting q in (1) in (S.5), we get $U_R^{B.1} = x_R^\Delta + (\phi/\theta)(2 - \phi)[(x_c^\Delta - x_c) - (x_R - x_R^\Delta)]$. From the solution of a and P for Case B.2, the conditions for which Case B.2 satisfies (S.1)-(S.6), and after substituting q in (1) in (S.5), we get $U_R^{B.2} = x_R^\Delta + \frac{1}{\theta}[(x_c^\Delta - x_c) - (x_R - x_R^\Delta)]$ which $\Longrightarrow U_R^{B.2} > U_R^{B.1}$ as since $(\phi^2 - 1)^2 > 0$. We can thus rule out <u>Case B.1</u>.

Case C.1 satisfies (S.1)-(S.6) and $\mu_1 \geq 0$ for $\frac{(x_R - x_R^\Delta)}{(x_c^\Delta - x_c)} \geq 2\theta$ (and in this case $a = \theta(x_c^\Delta - x_c)$) but not in (S.8). Thus we can rule out <u>Case C.1</u>. Case C.2 satisfies (S.7)-(S.13) and the conditions $\mu_1 \geq 0$, $\mu_2 \geq 0$ for $\theta > 1$. From the conditions $\mu_1 \geq 0$, $\mu_2 \geq 0$ for $\theta > 1$ in Case C.2, and substituting the expression for q in (1) in (S.6) yields $U_R^{C.2} = x_R^\Delta - \theta(x_c^\Delta - x_c)$. But $U_R^{A.2} > U_R^{C.2}$ as $x_R^\Delta + \frac{(x_R - x_R^\Delta)^2}{4\theta(x_c^\Delta - x_c)} > x_R^\Delta - \theta(x_c^\Delta - x_c)$. Thus we can rule out <u>Case C.2</u>. Finally, note that $U_R^{A.2} > U_R^{B.2}$ as $x_R^\Delta + \frac{(x_R - x_R^\Delta)^2}{4\theta(x_c^\Delta - x_c)} > x_R^\Delta + \frac{[(x_c^\Delta - x_c) - (x_R - x_R^\Delta)]}{\theta}$ which $\Longrightarrow$ we can rule out

Case B.2 as well. Hence we are left with just Case A.2 for the potential solution. Recall that Case A.2 satisfies (S.2)-(S.7) for $\frac{(x_R - x_R^{\Delta})}{(x_c^{\Delta} - x_c)} \leq 2$ and the level of a that solves the f.o.c in (S.3) for this case is $a^* = \frac{(x_R - x_R^{\Delta})^2}{4\theta(x_c^{\Delta} - x_c)}$ as claimed in part (ii) of Lemma 1 . Further, in Case A.2 $\mu_3 \geq 0$ which $\Longrightarrow P = 0$. Hence P that solves the f.o.c in (S.6) in this case is simply $P = 0$. We turn to solve for and characterize h^*. To do so, we need to first extract the expression for $\frac{\partial U_c}{\partial h}$. To this end, note that the first order condition of the civilians' optimization problem – where c chooses h to maximize U_c taking a and P as given – is

$$\frac{\partial U_c}{\partial h} \equiv \frac{\partial q}{\partial h}\left(x_c - x_c^{\Delta} + P\right) - 1 = 0 \quad \text{for} \quad h > 0 \tag{S.17}$$

$$\frac{\partial U_c}{\partial h} \equiv \frac{\partial q}{\partial h}\left(x_c - x_c^{\Delta} + P\right) - 1 \leq 0 \quad \text{for} \quad h = 0 \tag{S.18}$$

From $q = \frac{a}{a+\theta h}$ and $\frac{\partial U_c}{\partial h}$, we obtain $h = 0$ for $\theta(a+P) \geq \theta(x_c^{\Delta} - x_c)$ and $h = \left(\frac{x_c^{\Delta} - x_c - P}{\theta}\right) a - \left(\frac{a}{\theta}\right)$ for $0 < \theta(a+P) \leq \theta(x_c^{\Delta} - x_c)$. Next, we incorporate a^* in q and derive $\frac{\partial q}{\partial h}$ and then include the expression from $\frac{\partial q}{\partial h}$ into $\frac{\partial U_c}{\partial h}$ in (S.18) and solve for h. Doing so leads after some algebra to $h^* = (1 - \frac{1}{2\theta}\frac{(x_r - x_r^{\Delta})}{(x_c^{\Delta} - x_c)})\frac{(x_r - x_r^{\Delta})}{2\theta})$ as claimed in part (i) of Lemma 1. Finally, after incorporating a^* and h^* in q in equation (1) in the text and simplifying, we obtain $q^* = \frac{(x_r - x_r^{\Delta})}{2\theta(x_c^{\Delta} - x_c)}$ as claimed in part (iii) of Lemma 1.

Part (iv) From the CES production function $F(N, L)$, we obtain

$$\frac{\partial F}{\partial N} = \phi\varepsilon[\alpha N^{\rho} + (1-\alpha)L^{\rho}]^{\frac{\varepsilon}{\rho}-1}\alpha N^{\rho-1} \tag{S.19}$$

$$\frac{\partial F}{\partial L} = \phi\varepsilon[\alpha N^{\rho} + (1-\alpha)L^{\rho}]^{\frac{\varepsilon}{\rho}-1}(1-\alpha)L^{\rho-1} \tag{S.20}$$

Because the total marginal change in food output is $\left(\frac{\partial F}{\partial N}L + \frac{\partial F}{\partial L}N\right)$, we obtain from (S.19) and (S.20) and after some algebra

$$F(N, L) = \phi\varepsilon[\alpha N^{\rho} + (1-\alpha)L^{\rho}]^{\frac{\varepsilon}{\rho}-1}[\alpha N^{\rho-1} + (1-\alpha)L^{\rho-1}] \tag{S.21}$$

Proof of Claim 1: When a negative shock (i.e. food crisis) occurs, then by construction $\phi \sim -u[1, 0)$. From the expressions for $\frac{\partial F}{\partial N}$ and $\frac{\partial F}{\partial L}$ in the proof of Lemma 1, one can easily observe that $\frac{\partial F}{\partial N} < 0$ and $\frac{\partial F}{\partial L} < 0$ when $\phi \sim -u[1, 0)$. Differentiating (S.19) with respect to N gives

$$F_{NN} = \phi\left[\varepsilon\frac{F}{N}\left(\frac{\alpha N^{\rho}}{\alpha N^{\rho} + (1-\alpha)L^{\rho}}\right)N^{-2}\right]\left[(\varepsilon - \rho)\left(\frac{N^{\rho}}{\alpha N^{\rho} + (1-\alpha)L^{\rho}}\right) + (\rho - 1)\right] \tag{S.22}$$

Differentiating (S.20) with respect to L gives

$$F_{LL} = \phi\left[\varepsilon\frac{F}{L}\left(\frac{(1-\alpha)L^{\rho}}{\alpha N^{\rho} + (1-\alpha)L^{\rho}}\right)L^{-2}\right]\left[(\varepsilon - \rho)\left(\frac{(1-\alpha)L^{\rho}}{\alpha N^{\rho} + (1-\alpha)L^{\rho}}\right) + (\rho - 1)\right] \tag{S.23}$$

From (S.22) and (S.23), $F_{NN} < 0$ and $F_{LL} < 0$ when $\phi \sim -u[1,0)$.

Proof of Proposition 1: (i) $\phi \sim -u[1,0)$ when a food crisis occurs. Because $\phi \sim -u[1,0)$, one can check from the expressions for $\frac{\partial F}{\partial N}$ and $\frac{\partial F}{\partial L}$ in (S.19) and (S.20) that $\frac{\partial F}{\partial N} < 0$ and $\frac{\partial F}{\partial L} < 0$ when $\phi \sim -u[1,0)$ as claimed. The average products of labor and land given ϕ are respectively

$$\frac{F(N,L)}{L} = \frac{\phi[\alpha N^{\rho} + (1-\alpha)L^{\rho}]^{\frac{\varepsilon}{\rho}}}{L} \tag{S.24}$$

$$\frac{F(N,L)}{N} = \frac{\phi[\alpha N^{\rho} + (1-\alpha)L^{\rho}]^{\frac{\varepsilon}{\rho}}}{N} \tag{S.25}$$

Hence, the total (average) food output is $\left(\frac{F(N,L)}{L} + \frac{F(N,L)}{N}\right)$. From (S.24) $\frac{F(N,L)}{L} < 0$ when $\phi \sim -u[1,0)$ and from (S.25) $\frac{F(N,L)}{N} < 0$ when $\phi \sim -u[1,0)$. Hence $\left(\frac{F(N,L)}{L} + \frac{F(N,L)}{N}\right) < 0$ when $\phi \sim -u[1,0)$. (ii) Recall that $x_c = b_c + f_c$ where $f_c = \left(\frac{F(N,L)}{C}\right)$. From (S.21), one can check that $F(N,L) < 0$ for $\phi \sim -u[1,0)$ which $\Rightarrow f_c < 0$ when $\phi \sim -u[1,0)$. Further, it is plausible that $b_c < 0$ in a severe drought as R cannot credibly promise to maintain the same level of benefits for C given the drought's deleterious economic impact. Since $f_c < 0$ and $b_c < 0$ in this case, it follows that $x_c < 0$. (iii) From the previous proof $x_c < 0$ when $\phi \sim -u[1,0)$. Further, the civilians' expected utility is $qx_c + (1-q)(x_c^{\Delta} + P) - h$. If $h = 0$ in a drought, then from $q = \frac{a}{a+\theta h}$, it follows that $q = 1$. Therefore if $h = 0$ in a severe drought, then the civilians' expected utility is simply $x_c < 0$. If, however, $h > 0$ when $\phi \sim -u[1,0)$, then $q < 1$ and the civilians may obtain not just some $P^* \geq 0$ but also the expected utility $qx_c + (1-q)(x_c^{\Delta} + P) - h \geq 0$. Thus the civilians' dominant strategy is to opt for $h > 0$ over $h = 0$ when $\phi \sim -u[1,0)$.

Proof of Proposition 2: (i) From $h^* = (1 - \frac{1}{2\theta}\frac{(x_R - x_R^{\Delta})}{(x_c^{\Delta} - x_c)})\frac{(x_R - x_R^{\Delta})}{2\theta})$, we obtain

$$\frac{\partial h^*}{\partial \theta} = \frac{8\theta^2[(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)]^2 - 16\theta^2[(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)^2] + 8\theta[(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)]^2}{(4\theta^2(x_c^{\Delta} - x_c))^2} \tag{S.26}$$

which after some rearrangement leads to

$$\frac{\partial h^*}{\partial \theta} = \frac{8\theta[(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)]^2[(x_R - x_R^{\Delta}) - \theta(x_c^{\Delta} - x_c)]^2}{(4\theta^2(x_c^{\Delta} - x_c))^2} \tag{S.27}$$

Define $\theta \in [0, \overline{\theta}]$ where $\theta \in \Re_+$ and $\overline{\theta}$ defines the lower upper-bound of θ in $\Re_+$. When $\theta \to \overline{\theta}$, it follows from (S.27) that $\frac{\partial h^*}{\partial \theta} > 0$ as suggested.

(ii) Note that $(1-q^*) = 1 - \frac{(x_R - x_R^{\Delta})}{2\theta(x_c^{\Delta} - x_c)}$. Hence $\frac{\partial(1-q^*)}{\partial \theta} = \frac{[(x_R - x_R^{\Delta})2(x_c^{\Delta} - x_c)]}{(2\theta(x_c^{\Delta} - x_c))^2} > 0$.

Proof of Claim 2: Recall that $\frac{\partial U_c}{\partial h} \equiv \frac{\partial q}{\partial h}\left(x_c - x_c^{\Delta} + P\right) - 1 = 0$ for $h > 0$, while $\frac{\partial U_c}{\partial h} \equiv \frac{\partial q}{\partial h}\left(x_c - x_c^{\Delta} + P\right) - 1 \leq 0$ for $h = 0$. Since $\frac{\partial h^*}{\partial \theta} > 0$ (see proof of Proposition 2) in equilibrium, it follows that $h^* > 0$ and from the expression of $\frac{\partial U_c}{\partial h}$ that U_c can be maximized for $h^* > 0$ while U_c strictly decreases for $h = 0$. Hence in equilbrium when θ

is sufficiently high, $c's$ strictly dominant strategy is to opt for $h^* > 0$ which implies that $c \in C$ cannot credibly commit to not challenge R in this case and thus $h^* > 0$. Further, $\frac{\partial(1-q)}{\partial h^*} = \frac{[\theta(a+\theta h^*)(1-\theta h^*)]}{(a+\theta h^*)^2} > 0$ which implies that $(1-q)$ strictly increases in h^*. Hence $h^* > 0$ is perceived as a credible threat by R.

Proof of Claim 3: $\frac{\partial q^*}{\partial \theta} = \frac{-[(x_R - x_R^{\Delta})2(x_c^{\Delta} - x_c)]}{(2\theta(x_c^{\Delta} - x_c))^2} < 0$.

Proof of Proposition 3: When $\phi \sim -u[1,0)$, then from the proofs derived earlier $\frac{\partial h^*}{\partial \theta} > 0$, $\frac{\partial(1-q^*)}{\partial \theta} > 0$ and $\frac{\partial q^*}{\partial \theta} < 0$. For $\frac{\partial(1-q^*)}{\partial \theta} > 0$ and $\frac{\partial q^*}{\partial \theta} < 0$, we find that $\frac{da^*}{d\theta} > 0$ (see the proof for this below) which means that in equilibrium $P \to 0$ as claimed. Next, given that $h^* = (1 - \frac{1}{2\theta}\frac{(x_r - x_r^{\Delta})}{(x_c^{\Delta} - x_c)})\frac{(x_r - x_r^{\Delta})}{2\theta}) > 0$ and $a^* = \frac{(x_r - x_r^{\Delta})^2}{4\theta(x_c^{\Delta} - x_c)} > 0$ in equilibrium, the Jacobian J (using just h^* and a^*) is as follows

$$J = \begin{bmatrix} \frac{[(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)]^2}{2\theta(x_c^{\Delta} - x_c)^2} & \frac{(x_R - x_R^{\Delta})^2}{4\theta(x_c^{\Delta} - x_c)^2} \\ \frac{2\theta(x_c - x_c^{\Delta}) + 2(x_R - 1)}{(4\theta^2(x_c^{\Delta} - x_c))^2} & \frac{2\theta x_R((4\theta^2(x_c^{\Delta} - x_c)) - 4\theta^2[2\theta x_R(x_R - x_c^{\Delta}) + 2x_R(x_R^{\Delta} - 1) + 2(x_R^{\Delta})]^2}{(4\theta^2(x_c^{\Delta} - x_c))^2} \end{bmatrix} \tag{S.28}$$

Note that $\frac{(x_R - x_R^{\Delta})^2}{4\theta(x_c^{\Delta} - x_c)^2} > 0$ and $\frac{2\theta x_R((4\theta^2(x_c^{\Delta} - x_c)) - 4\theta^2[2\theta x_R(x_R - x_c^{\Delta}) + 2x_R(x_R^{\Delta} - 1) + 2(x_R^{\Delta})]^2}{(4\theta^2(x_c^{\Delta} - x_c))^2} > 0$. Likewise $\frac{(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)}{2\theta(x_c^{\Delta} - x_c)^2} > 0$ and $\frac{2\theta(x_c - x_c^{\Delta}) + 2(x_r - 1)}{(4\theta^2(x_c^{\Delta} - x_c))} < 0$ since $(x_R - 1) < 0$ and $(x_c - x_c^{\Delta}) < 0$ when $\phi \sim -u[1,0)$. Straightforward computation shows that $|J| > 0$. Checking for the sign of $\frac{da^*}{d\theta}$, we obtain by Cramer's rule

$$D = \begin{bmatrix} \frac{-\,(x_R - x_R^{\Delta})^2(x_c^{\Delta} - x_c)^2}{[4\theta(x_c^{\Delta} - x_c)]^2} & \frac{(x_R - x_R^{\Delta})^2}{4\theta(x_c^{\Delta} - x_c)^2} \\ \frac{8\theta(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)^2[(x_R - x_R^{\Delta}) - \theta(x_c^{\Delta} - x_c)]^2}{(4\theta^2(x_c^{\Delta} - x_c))^2} & \frac{2\theta x_R((4\theta^2(x_c^{\Delta} - x_c)) - 4\theta^2[2\theta x_R(x_r - x_c^{\Delta}) + 2x_R(x_R^{\Delta} - 1) + 2(x_R^{\Delta})]^2}{(4\theta^2(x_c^{\Delta} - x_c))^2} \end{bmatrix} \tag{S.29}$$

$\frac{8\theta(x_R - x_R^{\Delta})(x_c^{\Delta} - x_c)^2[(x_R - x_R^{\Delta}) - \theta(x_c^{\Delta} - x_c)]^2}{(4\theta^2(x_c^{\Delta} - x_c))^2} > 0$ for $\theta \in \Re_+$ while $\frac{-\,(x_R - x_R^{\Delta})^2(x_c^{\Delta} - x_c)^2}{[4\theta(x_c^{\Delta} - x_c)]^2} < 0$. Since $|D| < 0$ for $\theta \in \Re_+$, it follows that $\frac{da^*}{d\theta} = -\left[\frac{|J|}{|D|}\right] > 0$.

Proof of Claim 4: Strictly dominant strategy for R to opt for $a > 0$ when $\frac{\partial h^*}{\partial \theta} > 0$. Note that when $a > 0$, then from proof of Proposition 3, $P = 0$. For $a > 0$, $P = 0$, and $q \in (0,1)$, it follows that $U_R = qx_R + (1-q)x_R^{\Delta} - a$. If $a = 0$, then for $\frac{\partial h^*}{\partial \theta} > 0$, $q = 0$ and $(1-q) = 1$ and $P = 0$ which $\Rightarrow \overline{U_R} = x_R^{\Delta}$. Since $x_R > x_R^{\Delta}$ and $q \in (0,1)$, it follows that $U_R - \overline{U_R} > 0$ which $\Rightarrow$it is a strictly dominant strategy for R to opt for $a > 0$ when $\frac{\partial h^*}{\partial \theta} > 0$.

Proof of Claim 5: Prohibitive costs for R to deter C when $h^* \to \overline{h}$. Define $\overline{h}$ as the least upper bound of h^* in $\Re_+$. If $h^* \to \overline{h}$ then $\lim_{h^* \to \overline{h}} q = \frac{a}{a+\theta\overline{h}} \longrightarrow 0$. If $q = 0$, then from U_R, it follows (by construction) that $U_R = (x_R^{\Delta} - a) < 0$ which means that it may be too costly for for R to deter C when $h^* \to \overline{h}$.

Proof of Claim 6: From equation (S.3) in the proof of Lemma 1, $\frac{dh}{da} = \frac{dh}{da^*} = \left(\frac{x_c^{\Delta} - x_c - P}{\theta a^*}\right)\left(\frac{1}{2}\right) - \left(\frac{1}{\theta}\right)$ for $0 < \theta(a+P) \leq \theta(x_c^{\Delta} - x_c)$; otherwise $\frac{dh}{da} = 0$. Define $a^* \in [\underline{a}, \overline{a}]$ where $\overline{a}$ denotes a high level of killing of civilians. One can check that for $a^* \to \overline{a}$ and sufficiently high θ, $\frac{dh}{da^*} < 0$ which $\Rightarrow$ h decreases in a^*. Because $q = \frac{a}{a+\theta h}$, it follows that for $\lim_{h \to 0} q = \frac{a}{a+\theta h} > 0$ as claimed.

Proof of Proposition 4: Recall that

$$\frac{\partial h^*}{\partial \theta} = \frac{8\theta[(x_R - x_R^\Delta)(x_c^\Delta - x_c)]^2[(x_R - x_R^\Delta) - \theta(x_c^\Delta - x_c)]^2}{(4\theta^2(x_c^\Delta - x_c))^2} \tag{S.30}$$

If urban development is negligible, then in the limit $\theta \to 0$. From (S.30), one can check that for $\theta \to 0$, $\frac{\partial h^*}{\partial \theta} \to 0$. Because $q = \frac{a}{a+\theta h}$, it follows that $q = 1$ for $h^* \to 0$ which implies that the status quo prevails. When $q = 1$, then $U_R = (x_R - a) > U_R = qx_R + (1-q)(x_R^\Delta - P) - a$ for $a = 0$. Hence when urban development is negligible, then a tends to 0, as claimed.

Proof of Proposition 5: When $\theta > 0$, then from the proof of claim 3, $\frac{\partial q^*}{\partial \theta} < 0$. From the proof of proposition 3, one can easily check that for $\frac{\partial q^*}{\partial \theta} < 0$, $a^* \geqslant 0$ but that $a^* \not> 0$. In contrast, for $\phi \sim -u[1, 0)$, $\theta > 0$, we know from the proofs of claim 3 and claim 4 as well as the proof of Proposition 3 that $a^* > 0$ is a strictly dominant strategy and that $\frac{da^*}{d\theta} = -\left[\frac{|J|}{|D|}\right] > 0$.

Data Sources for Within-Country Analyses of Pakistan

Food Crisis, Urban Development and Anti-Government Demonstrations

- **SAMPLE**: 12 cities in Pakistan whose population is 300,000 citizens and above and (i) which are classifed as urban cities by the Government of Pakistan's Pakistan *Bureau of Statistics* and for (ii) which information is available to operationalize the variables of interest at the city-year level. These cities are listed in Chapter 5. Temporal range of Sample: 1978 to 1988 (years in which Pakistan is observed as a military dictatorship) and then again from 2000 to 2006 (years in which Pakistan is again observed as a dictatorship; it is a democracy from 1989 to 1998). 1978 is first year in which primary and secondary source data to code the variables is available. Hence the sample consists of 12 cities observed from 1978 to 1988 and then again from 2000 to 2006.

- **DEPENDENT VARIABLE**: Count variable labeled as *anti-government demonstrations*. This variable operationalizes for each city-year the number of violent attacks or demonstrations carried out by civilians against (i) government property in the city which includes destruction or overt physcial damage of government administrative buildings, offices as well as other government-owned physical assets such as the General Post Office [GPO], Trade Emporiums and so on); (ii) government security forces (this includes city-police units and paramilitary forces stationed within or outside the city [10 km radius]) and (iii) political and bureaucratic personnel from the government including the Zila Nazim, District Coordination Officer, and Union Administrators.

Data Sources: (i) Bureau of Police Research and Development [1978-2008]. *Riots in Pakistan*. Ministry of Interior, Government of Pakistan: Islamabad; (ii) Sindh Police Department. *Riots in Sindh*, 1975-2005. Police Department, Government of Sindh; (iii) Punjab Police Department. *Riots in Punjab*, 1975-2005. Police Department, Government of Punjab; (iv)Imam, A and Eazaz Dar. 2014. Democracy and Public Administration in Pakistan. London: CRC Press; (v) "Armed Conflict Location and Event Dataset" [ACLED]—Pakistan, 1999-2008; (vi) CIA – U. S. Central Intelligence Agency: Kashmir Region 2004, 2004; (vii) GADM – Global Administrative Areas: PAK_adm.zip, Ver 2.8, Nov 2015 http://biogeo.ucdavis.edu/data/gadm2.8/shp/PAK_adm.zip

(viii) Arif Hasan, 2002, *Understanding Karachi: Planning and Reform for the Future* (Karachi: City Press); (ix) International Crisis Group (2014). "Policing Urban Violence in Pakistan." Asia Report No. 255. Brussels: International Crisis Group; (x) Esser, D. (2004). "The city as area, hub and prey – patterns of violence in Kabul and Karachi." *Environment and Urbanisation*. 16/2: 31-38; (xi) Ghani, E. (2012). "Urbanisation in Pakistan: challenges and options." Paper presented at Global Development Network's 13th Annual Global Development Conference, Central European University, Budapest, June 17th. Also coded from national and regional-level newspapers including (i) English-Language newspapers such as *The Dawn* (Lahore and Karachi editions), *Daily Times*, *The Friday Times*, *Pakistan Observer*, and *Business Recorder* and (ii) Urdu-language newspapers such as *Nawa-i-Waqt*, *Daily Jang*, *Daily Nai Baat*, and *Daily Sarhad*.

- **INDEPENDENT VARIABLE(s):** *Food Crisis* and *Urban Development PC*

Data Sources for *Urban Development PC*: Data to construct this measure is drawn from the following primary and secondary sources: (i) Pakistan Bureau of Statistics (PBS). *Population Census.* Islamabad: Government of Pakistan; (ii) Pakistan Bureau of Statistics (PBS). *Pakistan Social and Living Standards Measurement.* Islamabad: Government of Pakistan; (iii) Arif, G. M. 2003. "Urbanisation in Pakistan: Trends, Growth and Evaluation of the Census." Working Paper: Pakistan Institute of Development Economics, Karachi; (iv) Economic Survey of Pakistan (1978-88; 2000-2006). *Economic and Social Indicators.* Ministry of Finance: Government of Pakistan, Islamabad; (v) Economic Survey of Pakistan (1978-88, 2000-2006). *Population, Labor Force and Employment.* Ministry of Finance: Government of Pakistan, Islamabad; (vi) Haider, Murtaza and Irteza Haider (2006) "Urban Development in Pakistan." In *Urbanization and Sustainability in Asia: Case Studies on Best Practice Approaches to Sustainable Urban and Regional Development*; pp. 245-272. Asian Development Bank, Manila, Philippines.

Data Sources for *Food Crisis*:

- **CONTROL VARIABLES**

A. *Log GDP per capita*, *unemp rate* (% labor force unemployed for each city-year), *inflationary crisis* [dummy variable coded as 1 when the local (i.e city-) level inflation rate in housing and utilities, clothing and footwear and transport exceeds 10% for a given city-year). Data to operationalize these controls are drawn from primary sources including (i) Economic Survey of Pakistan (1978-88; 2000-2006). Economic and Social Indicators. Ministry of Finance: Government of Pakistan, Islamabad; (ii) Zaidi, S.A (2005). *The Issues in Pakistan's Economy.* Oxford: Oxford University Press, Karachi; (iii) Economic Survey of Pakistan (1978-88; 2000-2006). *Population, Labor Force and Employment.* Ministry of Finance: Government of Pakistan, Islamabad; (iv) Economic Survey of Pakistan (1978-2008). *Fiscal Development.* Ministry of Finance: Government of Pakistan, Islamabad. *Log GDP per capita* is predicted to have a negative influence on anti-government dempnstrations while *unemp rate* and *inflationary crisis* is expected to be positively associated with the count dependent variable.

B. *Municipal election* (dummy variable coded as 1 in years in which local elections were held for municipal elections in the city). Operationalized from (i) Khan S R 2004. Pakistan under Musharraf (1999 – 2002). *Economic reform and political Change.* IST Ed. Vanguard Book,Islamabad; (ii) Mahmood, Safdar 2000. *Pakistan: Political Roots and Development 1947-1999.* Oxford University Press: Karachi; (iii) Muhammad A Malik. 2007. *Local Self Government in Pakistan* (Lahore: Emporium Publishers); and (iv) Election Commission of Pakistan (various years) "Local elections in Pakistan" Pakistan Bureau of Statistics, Islamabad: Government of Pakistan. *Municipal election* in cities in Pakistan is typically associated with criminality, corruption and violence. Hence we anticipate that this measure will be positively associated with the violent riots dependent variable.

C. *log land area* for each city (in square kilometers) in sample. Operationalized from PBS *Population Census*; Arif 2003; and Haider and Haider 2006. The larger the land area of a city, the more likely that the city's population will be dispersed whicch exacerbates collective action problems. Hence log land area is expected to be negatively associated with the anti-government demonstrations dependent variable.

D. *Paramilitary barracks* (annual number of para military [Pakistan Rangers, Civil Armed Forces] barracks located within each city or within a 10 km square radius outside the city) and *police stations* (annual number of central police stations, i.e police stations with more than 100 personnel, located in each city). Each of these two variables are expected to negatively influence anti-government demonstrations based on the resumption that these forces (if effective) may deter civilians in urban areas from engaging in anti-regime violent riots. Data for paramilitary and police from (i) Suddle, Mohammad S., "Reforming Pakistan's Police: An Overview", 120th International Senior Seminar Visiting Experts' Paper, Punjab University: Lahore; (ii) Pakistan Bureau of Statistics (all relevant years) *Pakistan Statistical Yearbook*. Islamabad: Government of Pakistan; and (iii) Bureau of Police Research and Development (various years) *Government Domestic Forces and Law and Order*. Ministry of Interior, Islamabad: Government of Pakistan.

Food Crisis, Urban Development and Mass Killing Campaigns

- **SAMPLE**: 12 cities in Pakistan whose population is 300,000 citizens and above. This city-year sample is described in the preceding subsection.

- **DEPENDENT VARIABLE**: Binary variable labeled as *mass killing*. This variable is coded as 1 when the number of civilians killed by government security forces is greater than or equal to 50 per city-year. Results remain robust for higher thresholds; i.e. when mass killing is greater than or equal to 75, 100, 125, and 150.

  Data Sources for *mass killing*: Drawn from several primary and secondary sources including ; (i) Armed Conflict Location and Event Dataset [ACLED]-Pakistan, 1999-2008; (ii) South Asia Terrorism Portal [SATP] (2003-2012). Civilian Fatalities. SATP; (iii) South Asia Terrorism Portal (2003-2012). Pakistan Body Count; SATP: (iv) CIA - U. S. Central Intelligence Agency: Kashmir Region 2004, 2004; (v) GADM - Global Administrative Areas: PAK_adm.zip, Ver 2.8, Nov 2015 http://biogeo.ucdavis.edu/data/gadm2.8/shp/I (vi) Christopher Rogers. 2010. Civilians in Armed Conflict: Civilian Harm and Conflict in Northwest Pakistan, Campaign for Innocent Victims in Conflict, (CIVIC); (vii) M. Ahmad, "Civilians: Common Victim of Anti-State Violence," (Conflict Monitoring Center, April 2011) http://cmcpk.wordpress.com/category/uncategorized/ ; (viii) Pakistan Institute for Peace Studies, Pakistan Security Report 2010, January 2011. Also consulted Pakistan Security Report 2008 and Pakistan Security Report 2009; (ix) Strengthening Participatory Organization, "Trail of Tragedy: A Chronology of Violence in Pakistan," (January 2011) http://www.spopk.org/index.php?option=com_docman&Itemid=

Also coded from national and regional-level newspapers including (i) English-Language newspapers such as *The Dawn* (Lahore and Karachi editions), *Daily Times*, *The Friday Times*, *Pakistan Observer*, and *Business Recorder* and (ii) Urdu-language newspapers such as *Nawa-i-Waqt*, *Daily Jang*, *Daily Nai Baat*, and *Daily Sarhad*.

- **INDEPENDENT VARIABLE(s):** *Food Crisis* and *Urban Development PC*; the data sources for each of these two measures has been listed in the previous subsection.

- **CONTROL VARIABLE(s):** *Log GDP per capita*, *unemp rate* (% labor force unemployed for each city-year), *paramilitary barracks*, *log land area*, *police stations*, and *inflationary crisis*. The data sources for each of these measures has been listed in the previous subsection as well.

Data Sources for Within-Country Analyses of Indonesia

Food Crisis, Urban Development and Anti-Government Demonstrations

- **SAMPLE**: 14 cities in Indonesia whose population is 400,000 citizens and above. These cities are classifed as metropolitan cities by the Government of Pakistan's Pakistan *Bureau of Statistics*. Information is available to operationalize the variables of interest at the city-year level is only available for these cities which are listed in Chapter 6. Temporal range of Sample: 1976 to 1998 (years in which Indonesia is observed as a dictatorship). Hence the sample consists of 14 cities observed from 1976 to 1998.

- **DEPENDENT VARIABLE**: Count variable labeled as *anti-government demonstrations*. This variable operationalizes for each city-year the number of violent attacks or demonstrations carried out by civilians against (i) Government property, including causing physical damage or destroying government administrative buildings, offices and other government-owned assets; (ii) Government security forces, including city forces such as the Indonesian National Police and the Municipal Police as well as national-level paramilitary and military forces stationed within city limits (up to a radius of 10 km); (iii) Administrative buildings owned and operated by the national and municipal governments.

Data Sources: (i) Budiman, A., Hatley, B. and Kingsbury, D. (eds) (1999) *Reformasi: crisis and change in Indonesia*, Melbourne: Monash Asia Institute; (ii) Eklöf, S. (1999) *Indonesian politics in crisis: the long fall of Suharto* 1996–98, Copenhagen: Nordic Institute of Asian Studies (NIAS); (iii) Soemardjan, S. (2002) 'Konflik-konflik sosial di Indonesia: refleksi keresahan masyarakat', Analisis CSIS, 31: 306–21; (iv) Suryanegara, A. M. (1999) *Benarkah reformasi melahirkan perang agama: HUT ke-49 RMS yang terlupakan, 18 Januari 1950–18 Januari 1999*, Jakarta: Al Ishlaly Press

- **INDEPENDENT VARIABLE(s):** *Food Crisis* and *Urban Development PC*

Data Sources for *Urban Development PC*: Data to construct this measure is drawn from the following sources: (i) Biro Pusat Statistik [BPS] (1990) *Statistical yearbook of Indonesia* 1990, Jakarta: Biro Pusat Statistik; (ii) BPS (1978-95) *Statistical yearbook of Indonesia* (all listed years), Jakarta: Biro Pusat Statistik; (iii) BPS (1997) *Penduduk Kalimantan Tengah*: *hasil sensus penduduk tahun* 1996, Jakarta: Badan Pusat Statistik; (iv) BPS Kalimantan Tengah (1997) *Kalimantan Tengah dalam angka* (Kalimantan Tengah in figures): 1998, Palangkaraya: Badan Pusat Statistik Propinsi Kalimantan Tengah; (v) Hill, H. (ed.) (2000) *The Indonesian Economy*, 2 edn, Cambridge [etc.]: Cambridge University Press; (vi) Rutz, W. (1987) *Cities and towns in Indonesia: their development, current positions and functions with regard to administration and regional economy*, Berlin: Borntraeger; (vii)

Data Sources for *Food Crisis*: (i) BPS Sulawesi Tengah (1975-1983) *Sulawesi Tengah dalam angka* 1975-83, Palu: Badan Pusat Statistik Propinsi Sulawesi Tengah; (ii) BPS Sulawesi Tengah (1984-1991) *Sulawesi Tengah dalam angka* 1984-91, Palu: Badan Pusat Statistik Propinsi Sulawesi Tengah; (ii) BPS Sulawesi Tengah (1992-1998) *Sulawesi Tengah dalam angka* 1992-98, Palu: Badan Pusat Statistik Propinsi Sulawesi Tengah(iii) —— (2001a)

‘Karakteristik penduduk Kabupaten Poso: hasil sensus penduduk 2000’, Palu: Badan Pusat Statistik Propinsi Sulawesi Tengah; (iii) —— (2001b) ‘Karakteristik penduduk Propinsi Sulawesi Tengah: hasil sensus penduduk 2000’, Palu: Badan Pusat Statistik Propinsi Sulawesi Tengah; (iv) —— (2002a) ‘Produk Domestik Regional Bruto Kabupaten/Kota menurut lapangan usaha di Propinsi Sulawesi Tengah 1997–2000’, Palu: Badan Pusat Statistik Propinsi Sulawesi Tengah; (v) —— (2002b). Sulawesi Tengah dalam angka 2001, Palu: Badan Pusat Statistik Propinsi Sulawesi Tengah.

- **CONTROL VARIABLES**

  A. *Log GDP per capita*, *unemp rate* (% labor force unemployed for each city-year), *inflationary crisis* [dummy variable coded as 1 when the local (i.e city-) level inflation rate in housing and utilities, clothing and footwear and transport exceeds 10% for a given city-year), *population*, *log land area* for each city (in square kilometers): Data to operationalize these variables is from (i) Damanik, R. (2003) *Tragedi kemanusiaan Poso: menggapai surya pagi melalui kegelapan malam* [Jakarta/Palu]: PBHI/LPS-HAM Sulteng.

  B. *Chinese Proportion* (fraction of ethnic Chinese residents in each city-year in the sample). Data to operationalize these controls are drawn from (i) Coppel, C. A. (2002) Studying the ethnic Chinese in Indonesia, Singapore: Singapore Society of Asian Studies; (ii) Coppel, C.A. (ed.) (2006) Violent conflicts in Indonesia: analysis, representation, resolution, London: Routledge

  B. *Municipal police* (annual number of central police stations, i.e police stations with more than 100 personnel, located in each city) and *military barracks* (annual number of military barracks located within each city or within a 20 km square radius outside the city):

  C. *East Timor* campaign (dummy variable coded as 1 for city-years in which military campaigns carried out by the Indonesian military in East Timor): Data for this dummy variable is taken from (i) Cribb, R. (ed.) (1990) *The Indonesian killings: studies from Java and Bali*, Clayton, Victoria: Centre of Southeast Asian Studies, Monash University; (ii) —— (2001) 'How many deaths? Problems in the statistics of massacre in Indonesia (1965–1966) and East Timor (1975–1980)', in I. Wessel and G. Wimhöfer (eds) *Violence in Indonesia*, Hamburg: Abera-Verl,

Food Crisis, Urban Development and Mass Killing Campaigns

- **SAMPLE**: 14 cities in Indonesia whose population is 400,000 citizens and above. This city-year sample is described in the preceding subsection.

- **DEPENDENT VARIABLE(s)**: Binary variable labeled as *mass killing.* This variable is coded as 1 when the number of civilians killed by government security forces is greater than or equal to 50 per city-year. Results remain robust for higher thresholds; i.e. when mass killing is greater than or equal to 75, 100, 125, and 150.

  Data Sources for *mass killing*: Drawn from several primary and secondary sources including: (i) Cribb, R. (ed.) (1990) *The Indonesian killings: studies from Java and Bali*, Clayton, Victoria: Centre of Southeast Asian Studies, Monash University; (ii) —— (2001) 'How many deaths? Problems in the statistics of massacre in Indonesia (1965–1966) and East Timor (1975–1980)', in I. Wessel and G. Wimhöfer (eds) *Violence in Indonesia*, Hamburg: Abera-Verl; (iii) National Human Rights Commission of Indonesia, "Results of Monitoring and Investigating of Five Incidents at Timika and One Incident at Hoea, Irian Jaya During October 1994-June 1995" (Jakarta: September 1995); (iv) Australian Council for Overseas Aid, *Trouble at Freeport*, (Melbourne: Australian Council for Overseas Aid, April1995); (v) Catholic Church of Jayapura, Violations of Human Rights in the Timika Area of Irian Jaya, Indonesia (August 1995); (vi) Survival International, Rio Tinto Critic Gagged (London: Survival International, May 1998); RFK Memorial Center for Human Rights and the Institute for Human Rights Studies and Advocacy, Incidents of Military Violence Against Indigenous Women in

Irian Jaya (West Papua), Indonesia (Washington/Jayapura: May 1999); (vii) Chris Ballard, "The Signature of Terror: Violence, Memory and Landscape at Freeport", in *Inscribed Landscapes: Marking and Making Place* in Bruno David & Meredith Wilson eds. 2001; (viii) "A Report on the Human Rights Violations Against the Local People in the Area Around Timika," Region of Fak-Fak, Irian Jaya: Year 1994-1995, 4 (Aug. 1, 1995), authorized by the Indonesian Human Rights Commission (Komnas HAM) (Decree of Commission Chairman, dated 5th February 2001, Ref. No.: 020/KOMNAS HAM/II/2001); (viii) International Crisis Group (2000a) 'Indonesia: overcoming murder and chaos in Maluku', Jakarta/Brussels: ICG. Online. Available http://www.hrw.org/; (ix) International Crisis Group (2000b) 'Indonesia's Maluku crisis: the issues', Jakarta/Brussels: ICG; (x) Norwegian Refugee Council (2002), *Profile of Internal Displacement: Indonesia: Compilation of the information available in the Global IDP Database of the Norwegian Refugee Council*, Norwegian Refugee Council/Global IDP Project;

- **INDEPENDENT VARIABLE(s):** *Food Crisis* and *Urban Development PC*; the data sources for each of these two measures for the Indonesia case has been listed in the previous subsection.

- **CONTROL VARIABLE(s):** *Log GDP per capita*, *municipal police*, *military barracks*, *log land area*, *East Timor Campaign*, *Population* and *Chinese Proportion*. The data sources for each of these variables in the Indonesia case has also been listed in the previous subsection.