Coup Threat and Income Redistributive Policy of Post-Democratization*

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Abstract

We develop a three-player (the poor, the rich and the military) model in which the military plays a crutial role in coup, as an independent interest group. Our approach of analysis is based on the two-player framework proposed by Acemoglu and Robinson (2006) in which there are the conflicts of redistribution between the rich and the poor. As a result, we demonstrate that in the equilibrium, an increase of military rent (redistribution) is a useful means to preclude a coup. There is a remarkable contrast between our conclusion and the foregoing researches which show that arms transfer facilitates the occurrence of coup. Some evidences support our conclusion.

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1 Introduction

There is a widespread claim in political science that the military often intervenes not on behalf of a social group but with its own interests in mind (e.g., Stepan, 1988; Mbaku, 1991; Kimenyi and Mbaku, 1995; Fitch, 1998; Loveman, 1999). However, there are as yet few generalizations about the objectives and behaviors of the military.

Acemoglu and Robinson (2006) develop a theory of political institutions and transitions. They consider a society divided into two groups, the rich and the poor. Their model implicitly identifies the military with the rich attempting a coup and considers neither its independent interests nor its role as a political institution.

Ticchi and Vindigni (2003) firstly used the methodological approach and the tools of game theory to examine the behavior of the military. They model the use of conscription by democratic states in order to avert military coups, and recognize that coups by elite groups against a democratic regime can only be organized with the support of the military. Bhave and Kingston (2006) present a three-player dynamic model to argue the consolidation of democracy and show the conditions under which coups are likely to occur.

However, although the works of Ticchi and Vindigni (2003) and Bhave and Kingston (2006) offer some explanations on the role of the military, their claims can not sufficiently describe the real behaviors of the military because their theory can not explain the existence of military regime, such as the present Myanmar.

In reality, the military often intervenes not on behalf of a social group but with its own interests in mind. It is also clear that in developing societies, the military is very powerful relative to other social and economic groups. Actually, there are many circumstances under which democratic and democratic regimes are overthrown by military coups, reverting to dictatorship (e.g., 30s $\sim$ 80s Argentina).

Especially, the governments of many African countries face a non-negligible risk of a coup perpetrated by their own military: even since 2000 there have been successful coups in the Central African Republic, Chad, Cote d'Ivoire, Equatorial Guinea, Mauritania, Sao Tome and Principe, and Togo. Collier and Hoeffler (2006) develop an empirical model of coups to investigate the relationship between coup risk and military spending. They conclude that in many African countries, an increase in military spending significantly reduces coup risk.

However, until now, there does not yet exist a theoretical model which can explain why there is such a relationship between coup risk and military spending.

For the purpose of grasping the objectives and behaviors of the military, we use the basic frameworks of Acemoglu and Robinson (2006) and Bhave and Kingston (2006) to investigate the conditions under which a civilian government can maintain control of the military. In our model, there are three players: the poor (the government), the rich and the military, and we assume that the military has two types: *soft* and *hard*. The poor (the government) and the rich have taxable incomes, and the military is paid from tax revenue. Players compete over two policy instruments: the tax rate and the rents obtained by the military. Democracy is the rule of the poor, Authoritarian Regime ($AR^{(s)}$ and $AR^{(h)}$) is governed by a coalition of the rich and the military, while Military Regime is the rule of the military. A regime change is costly and it will occur only if the revolt group can gain a higher expected value from regime change than that under the status quo. However, neither Authoritarian Regime nor Military Regime favors redistribution to the poor. The rich prefer a low tax rate, and low military rent; whereas the military would prefer a high tax rate and high military rent. We describe the range of redistributive tax rate under which coups against democratic government arise, and over which coups are avoidable.

We demonstrate that in equilibrium, the poor (the government) have to redistribute a large military rent to the military to preclude a coup. In other words, if the poor (the government) do not perform redistribution policy that sufficiently prevents the military from initiating a coup, a coup arises. In particular, a three-player model firstly brings into focus the policy options available to a democratic government when it attempts to preclude regime changes. As long as the government can safeguard the institutional interests of the military, democracy will be sustained irrespective of the preferences of the rich, because the rich lack the power to oust the existing regime single-handedly. There is a remarkable contrast between our conclusion and the foregoing researches. For instance, Maniruzzaman (1992) shows that in Pakistan, Turkey, Bangladesh, Ethiopia and Latin America, arms transfer facilitates the occurrence of coup or the normal government reaction to coup risk is to cut military spending or the size of the military.

This paper is organized as follows. Section 2 provides the model. We present the preferences of the rich and the military for coup under different political regimes. Section 3 analyzes the coup game and conducts the equilibrium of game. Section 4 concludes.

2 The Model

We consider an incomplete information game between three groups of agents, the poor (superscripted p), the rich (superscripted r) and the military (superscripted m). The military has two types: *soft* and *hard*, and this is the private information of the military. We consider a situation that democracy is threatened by a coup and the poor (government) have to redistribute to stave off it. Regime transition will arise from both the military and the rich's decisions of attending a coup. While what regime will be realized depends on the military's type. If the military's type is *soft*, coup will occur only when both the military and the rich attend, and after initiating a coup, *Authoritarian Regime* (superscripted $AR^{(s)}$) will be realized with a small coup cost, in which the military and the rich have a same bargaining power to decide redistributive tax rate and military rent. If the military's type is *hard*, the military has two choices: one is initiating a coup by himself, and *Military Regime* (superscripted MR) will be realized where the redistributive tax rate and military rent are decided by the military but having a large coup cost; the other is making a coalition with the rich, and *Authoritarian Regime* (superscripted $AR^{(h)}$) is realized with a small coup cost, in which the military will obtain a larger military rent for having a larger bargaining power than the one under *Authoritarian Regime* ($AR^{(s)}$). In addition, if only the rich attempt a coup, there will be no political regime change.

2.1 Fundamentals

We formulate the model based on the works of Acemoglu and Robinson (2006) and Bhave and Kingston (2006). We assume that in the population there exists $n+1$ players, namely n citizens (the poor and the rich) and the military, where n is odd. A fraction $1-\delta > 1/2$ of the citizens is poor, with identical income y^p, and the remaining fraction δ is rich, with identical income y^r which $y^r > y^p$. Mean citizen income is $\bar{y}$ and $y^p < \bar{y} < y^r$, where $\bar{y} = \frac{1}{n}\sum_{i=1}^{n} y^i = \delta y^r + (1-\delta)y^p$. Throughout the paper, we analyze the actions of these agents in a turbulent period in which the military and the rich form a coalition to pose a coup threat.

The timing of events is as follows:

- The poor (government) announces τ and $m(\tau)$.
- Nature chooses the type of the military: *soft* and *hard*, but it is not observed by the poor and the rich.
- The rich and the military move next and decide whether or not to carry out a coup, simultaneously.
- If the military's type is *soft*, and both the military and the rich decide to carry out a coup, the coup succeeds. Then the military and the rich take control of the means of production and set tax rate and military rent through negotiations.
- If the military's type is *hard*, the military has two choices: one is carrying out a coup solely, the coup succeeds and the military sets tax rate and military rent by himself; the other is cooperating with the rich to initiate a coup, the coup succeeds, then the military and the rich take control of the means of production and set tax rate and military rent through negotiations.
- If the military chooses not to mount a coup, then coup will not occur.
- Incomes are realized and consumption takes place.

The military does not participate in voting, and his objective is to get more military rent by increasing tax revenue which is not redistributed to the civilian population.

[SEE FIGURE 1]

Figure 1 shows that the simplest coup game. Since the *collective-action* problem is not our focus, we simply assume that it has been solved in high-state (e.g., economic crisis). [1]

As in Acemoglu and Robinson (2006), we define income inequality, θ, as the share of total income accruing to the rich; In other words, we have a per capita income of all poor as follows:

$$y^p = \frac{(1-\theta)n\bar{y}}{(1-\delta)n} = \frac{(1-\theta)\bar{y}}{1-\delta}, \qquad y^r = \frac{\theta n\bar{y}}{\delta n} = \frac{\theta\bar{y}}{\delta}. \tag{1}$$

Notice that an increase in θ represents an increase in inequality and from (1), we can get $\theta > \delta$.

[1] See the surveys in Lichbach (1995) and Moore (1995).

In any political system, the only available fiscal instrument is a linear income tax rate, denoted τ. All agents face the same tax rate and taxes are used both to redistribute among the poor and to pay the military. The government has a balance budget that levies a proportional tax on income and performs a lump-sum transfer to all poor equally.

However, it is costly to raise taxes. We assume that levying a redistributive tax rate τ increases the costs of taxation $C(\tau)$ where $C'(\cdot) > 0, C''(\cdot) > 0, C'(0) = 0$ and $C'(1) > 1$. Under democratic regime, because the median voter is a poor agent, the tax rate and military rent are τ^p and m^0 respectively. Thus, it means that there is an incentive for both the military and the rich to mount a coup against democracy.

After the redistributive tax rate, τ, is determined, the poor get a transfer $[\tau - C(\tau)]n\bar{y}$, out of which it makes a payment $mn\bar{y}$ to the military. We assume that there exists a minimal fraction m^0 of national income that must be invested in the military in order to allow society to organize for production. For simplicity, suppose that spending above this amount will not increase income. Therefore, a transfer payment of T is defined as follows:

$$T = \frac{1}{n}\left[\sum_{i=1}^{n} \tau y^i - (C(\tau) + m)\, n\bar{y}\right] = [\tau - C(\tau) - m]\,\bar{y}. \tag{2}$$

The indirect utility for the rich and the poor is the sum of post-tax incomes and transfer payments received. The indirect utility of the military is simply the payment that it receives from the government, normalized by the national population. That is,

$$\begin{aligned} V^i(D|\tau, m) &= (1-\tau)y^i + [\tau - C(\tau) - m]\,\bar{y}, \\ V^m(D|\tau, m) &= m\bar{y}. \end{aligned} \tag{3}$$

where D means democracy and $i \in \{p, r\}$.

The political system determines a nonnegative tax rate. All citizens have single-peaked preferences and vote on τ and m to maximize their indirect-utility functions. Therefore, the tax rate preferred by the citizens must satisfy the first-order condition (by Kuhn-Tucker condition):

$$\begin{aligned} &-y^p + [1 - C'(\tau^p)]\bar{y} = 0 \quad \text{and} \quad [\tau^p - C(\tau^p)] > m^0 \quad \text{or} \\ &-y^r + [1 - C'(\tau^r)]\bar{y} \leq 0 \quad \text{and} \quad [\tau^r - C(\tau^r)] = m^0. \end{aligned} \tag{4}$$

It is clear that both the poor and the rich will seek to minimize m, and thus their preferred policy will be m^0. As such, voting will essentially occur on a single dimensional policy space, where this policy is the tax rate. The rich prefer minimal redistribution, so their most preferred tax rate, τ^r, is defined implicitly by

$$\tau^r - C(\tau^r) = m^0. \tag{5}$$

Notice that because the majority of the population is the poor, the median voter is a poor citizen. Let the equilibrium tax rate be τ^p, it is implicitly given by

$$\frac{\theta - \delta}{1 - \delta} = C'(\tau^p) \in (0, 1). \tag{6}$$

It follows that $\tau^p > \tau^r$. The indirect utilities of the players under democracy are now given by:

$$\begin{aligned} V^i(D|\tau^p, m^0) &= (1 - \tau^p)y^i + \left[\tau^p - C(\tau^p) - m^0\right]\bar{y}, \\ V^m(D|\tau^p, m^0) &= m^0\bar{y}. \end{aligned} \tag{7}$$

The military's most preferred policy is to maximize tax revenue which is not redistributed to the poor. Since $C'(\tau^p) < 1$, tax revenue would be maximized at a tax higher than τ^p, where the marginal cost of taxation equals the increase in revenues.

2.1.1 Authoritarian Regime ($AR^{(s)}$)

Authoritarian Regime ($AR^{(s)}$) is a coalition between the rich and the military of *soft* type, neither of which favors redistribution to the poor. The rich prefer a low tax rate and low military rent, but the military prefers a high tax rate and high military rent. However, the military requires the assistance of the rich in the organization of the economy, and the rich need the coercive powers of the military in order to impose their will on the disenfranchised masses.

After initiating a coup, the military of *soft* type and the rich will decide the tax rate by negotiation. Because $\tau^r < \tau^p$, there is a range of bargaining solutions such that both groups would be better off under Authoritarian Regime than under democracy. Therefore, suppose that as the outcome of some bargaining process, an Authoritarian Regime ($AR^{(s)}$) sets a tax rate $\tau^{AR^{(s)}}$. Thus the payoffs of the players after a coup will be:

$$
\begin{aligned}
V^i(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) &= (1-\psi^L)(1-\tau^{AR^{(s)}})y^i \\
V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) &= (1-\psi^L)\left[\tau^{AR^{(s)}} - C(\tau^{AR^{(s)}})\right]\bar{y}
\end{aligned}
\tag{8}
$$

where $\psi^L \in (0,1)$ is coup cost and $i \in \{p, r\}$.[2]

From (8), we know that in Authoritarian Regime ($AR^{(s)}$), the military is paid the entire tax revenue. Assume that, if either party withdraws from the coalition, there will be a transition to democracy. Then, to preserve the stability of coalition, Authoritarian Regimes must set $\tau^{AR^{(s)}}$ such that $V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) > V^m(D|\tau^p, m^0)$ and $V^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) > V^r(D|\tau^p, m^0)$. Let $\underline{\tau}$ be the tax rate below which the military would prefer democracy, and let $\overline{\tau}$ be the tax rate above which the rich will prefer democracy. By (1), (7) and (8), we get

$$
\begin{aligned}
\underline{\tau} &= \frac{m^0}{1-\psi^L} + C(\underline{\tau}), \\
\overline{\tau} &= \frac{(\tau^p - \psi^L)\theta - \big(\tau^p - C(\tau^p) - m^0\big)\delta}{(1-\psi^L)\theta}.
\end{aligned}
\tag{9}
$$

By (5), it is clearly that $\underline{\tau} = \tau^r$. Thus, we can write $\tau^{AR^{(s)}} \in (\tau^r, \overline{\tau})$. [3] Since the precise bargaining arrangement between the rich and the military is not our focus, we simply assume that the military and the rich have same bargaining power in the ruling coalition, so that the tax rate under an Authoritarian Regime ($AR^{(s)}$) is

$$
\tau^{AR^{(s)}} = \frac{1}{2}\overline{\tau} + \frac{1}{2}\underline{\tau}. \tag{10}
$$

[2]We consider that the coup cost is small when the military makes a coalition with the rich to undertake a coup. The reason is that the military would easily rule over a completely disenfranchised population because he obtains the support of the rich who give him the resources to do so.

[3]Notice that a military-rich arrangement is feasible, if $\overline{\tau} - \underline{\tau} > 0$, i.e., $\frac{(\tau^p-\psi^L)\theta-[\tau^p-C(\tau^p)-m^0]\delta}{(1-\psi^L)\theta} - \frac{m^0}{1-\psi^L} + C(\underline{\tau}) > 0$. Solving this inequality, we obtain there exists a coup cost, ψ^L, which satisfies $\psi^L < \frac{[\tau^p-m^0-C(\underline{\tau})]\theta-[\tau^p-m^0-C(\tau^p)]\delta}{1-C(\underline{\tau})}$.

2.1.2 Authoritarian Regime ($AR^{(h)}$)

Authoritarian Regime ($AR^{(h)}$) is a coalition between the rich and the military of *hard* type, neither of which favors redistribution to the poor. Similar to Authoritarian Regime ($AR^{(s)}$), after initiating a coup, the military of *hard* type and the rich will decide the tax rate by negotiation. However if the military's type is *hard*, there will be a larger bargaining power for the military. Therefore, suppose that as the outcome of some bargaining process, an Authoritarian Regime ($AR^{(h)}$) sets a tax rate $\tau^{AR^{(h)}}$. Thus the payoffs of the players after a coup will be:

$$
\begin{aligned}
V^i(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) &= (1-\psi^L)(1-\tau^{AR^{(h)}})y^i \\
V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) &= (1-\psi^L)\left[\tau^{AR^{(h)}} - C(\tau^{AR^{(h)}})\right]\bar{y}
\end{aligned}
\tag{11}
$$

where ψ^L is coup cost and $i \in \{p, r\}$.

To preserve a coalition, as ($AR^{(s)}$), Authoritarian Regime must set $\tau^{AR^{(h)}}$ such that $V^m(AR^{(h)} |\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) > V^m(D|\tau^p, m^0)$ and $V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) > V^r(D|\tau^p, m^0)$. For the coup cost under $AR^{(h)}$ is identical with the one under $AR^{(s)}$, we can derive the same value as (9). For simplicity, we omit the detailed descriptions here and describe the tax rate under Authoritarian Regime ($AR^{(h)}$) directly.

We assume that the military has bargaining power $\alpha \in (\frac{1}{2}, 1)$ in the ruling coalition, so that the tax rate under Authoritarian Regime ($AR^{(h)}$) is[4]

$$\tau^{AR^{(h)}} = \alpha\overline{\tau} + (1-\alpha)\underline{\tau}. \tag{12}$$

2.1.3 Military Regime (MR)

Military Regime is a rule of the military. The military would perform his most preferred tax rate and obtain the highest military rent. However, because the military has not acquired the assistance of the rich in the organization of the economy, there will be a large coup cost after initiating a coup.

After initiating a coup, the military of *hard* type will decide the tax rate independently. Obviously, the military will set τ^m, i.e., his most preferred tax rate. For $i \in \{p, r\}$, the payoffs

[4] See the case of Authoritarian Regime ($AR^{(s)}$) for details.

of the players will be:

$$
\begin{aligned}
V^i(MR|\tau^{MR}, m(\tau^{MR})) &= (1-\psi^H)(1-\tau^{MR})y^i \\
V^m(MR|\tau^{MR}, m(\tau^{MR})) &= (1-\psi^H)\left[\tau^{MR} - C(\tau^{MR})\right]\bar{y}
\end{aligned} \tag{13}
$$

where $\psi^H \in (0,1)$ is coup cost and $i \in \{p, r\}$. [5] We assume that $\psi^L < \psi^H$.

From (13), we know that Military Regime sets the tax rate τ^m and pay the entire tax revenue to the military. Figure 2 illustrates the relations of the various tax rates.

[SEE FIGURE 2]

3 Analysis of the Game

For whether coup occurs or not, the military is the key player. Without the military's support, coup will not succeed. Thus deciding whether to mount a coup, the military will compare the payoffs of post coup with the status quo under democracy. Here, we define the *participation constraints for coup* of the military. We say that the *participation constraints for coup* bind if

$$
\begin{aligned}
V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) &> V^m(D|\tau^p, m^0), \\
V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) &> V^m(D|\tau^p, m^0), \\
V^m(MR|\tau^{MR}, m(\tau^{MR})) &> V^m(D|\tau^p, m^0).
\end{aligned} \tag{14}
$$

where $V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, $V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$, $V^m(MR|\ \tau^{MR}, m(\tau^{MR}))$ and $V^m(D|\tau^p, m^0)$ denote the payoff to the military under Authoritarian Regime ($AR^{(s)}$), Authoritarian Regime ($AR^{(h)}$), Military Regime and Democracy, respectively.

(14) means that the military will have an incentive to take part in coup if the payoff of post-coup is larger than that of status quo.

Similarly, we also define the *participation constraints for coup* of the rich as follows:

$$
\begin{aligned}
V^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) &> V^r(D|\tau^p, m^0), \\
V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) &> V^r(D|\tau^p, m^0).
\end{aligned} \tag{15}
$$

[5] Contrast to Authoritarian Regime, under Military Regime there will be a large social stocks destroyed. For simplicity, we assume that the coup cost is larger than the one under Authoritarian Regime.

where $V^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, $V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$ and $V^r(D|\tau^p, m^0)$ denote the payoff to the rich under Authoritarian Regime ($AR^{(s)}$) and Authoritarian Regime ($AR^{(h)}$) and Democracy, respectively.

(15) means that the rich will have an incentive to take part in coup if the payoff of post-coup is larger than that of status quo. Actually, for the military being the key player, the poor can take no account of the participation constraint for coup of the rich. And prior to deriving the equilibrium of the game, we present the following important assumption and corollary:

Assumption.

$$V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) > V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) > V^m(MR|\tau^{MR}, m(\tau^{MR})). \quad (16)$$

This assumption shows that irrespective of the military's types, making a coalition with the rich will bring in a larger payoff for the military, for there will be a high coup cost when Military Regime is realized (i.e., the lacks in know-how of economic management; criticism from the international society). While comparing to the payoff under Authoritarian Regime ($AR^{(h)}$), the payoff under Authoritarian Regime ($AR^{(s)}$) is small because the military has a relatively small bargaining power. In fact, this assumption corresponds exactly to realities.

Whereas for the rich, we have the following relation of the payoffs under different political regimes:

Corollary.

$$V^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) > V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) > V^r(MR|\tau^{MR}, m(\tau^{MR})). \quad (17)$$

We can easily derive the relation of (17) by our definitions to the payoff of the rich under Authoritarian Regime ($AR^{(s)}$, $AR^{(h)}$) and Military Regime. And for the poor, by the definitions of (8), (11) and (13), we can also obtain the same relations of payoffs.

3.1 Equilibrium of the Game

Combining the above analysis, we can describe the equilibrium of the game as follows:

Proposition.

- *When the military's participation constraint for coup, (14), does not bind, the poor redistribute with (τ^p, m^0), both the rich and the military choose no coup.*

- *When the military's participation constraint for coup, (14), binds, then*
  - *If the poor make a redistribution which satisfies* $V^m(D|\tau, m(\tau)) \geq V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$*, i.e.,* $m(\tau) \geq (1-\psi^L)(\tau^{AR^{(h)}} - C(\tau^{AR^{(h)}}))$*, to the military, both soft and hard type choose no coup, and the rich choose no coup with probability* p*, coup with probability* $1-p$ *for any* $p \in (0,1)$*.*
  - *If the poor redistribute military rent which satisfies* $V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(h)}})) \leq V^m(D|\tau, m(\tau)) < V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$*, i.e.,* $(1-\psi^L)(\tau^{AR^{(s)}} - C(\tau^{AR^{(s)}})) \leq m(\tau) < (1-\psi^L)(\tau^{AR^{(h)}} - C(\tau^{AR^{(h)}}))$*, both soft and hard type choose no coup, the rich choose no coup with probability* p*, coup with probability* $1-p$*, where* $p \geq \frac{V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) - V^m(D|\tau, m(\tau))}{V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) - V^m(MR|\tau^{MR}, m(\tau^{MR}))} \in (0,1)$*.*

Proof. See Appendix 2. □

This proposition shows that whether a coup will happen depends on the value of $(\tau, m(\tau))$ to the military. If the military's payoff obtained from redistribution is higher than that under Authoritarian Regime ($AR^{(h)}$), even the hard type has no incentive to initiate a coup. And when the military's payoff from redistribution is higher than that under ($AR^{(s)}$) but lower than that under ($AR^{(h)}$), because the military is uncertain whether the rich choose coup, i.e., if the rich do not take part in coup, the military would be worse off under Military Regime than under Democracy, as a result, the military also choose no coup.

The most important claim of this proposition is that for the military to be the key player (whose action decides whether the coup will occur or not), the poor (the government) have to redistribute a relative high military rent to the military, to prevent a coup from occurring, than redistributing to the rich. In other words, if the poor (the government) do not give such a high military rent to the military, a coup arises and thus there would be a transition to an Authoritarian Regime or a Military Regime.

Figure 3 summarizes the strategies (off-equilibrium-path and on-equilibrium-path) of the military according to the redistributive policy performed by the poor (government).

[SEE FIGURE 3]

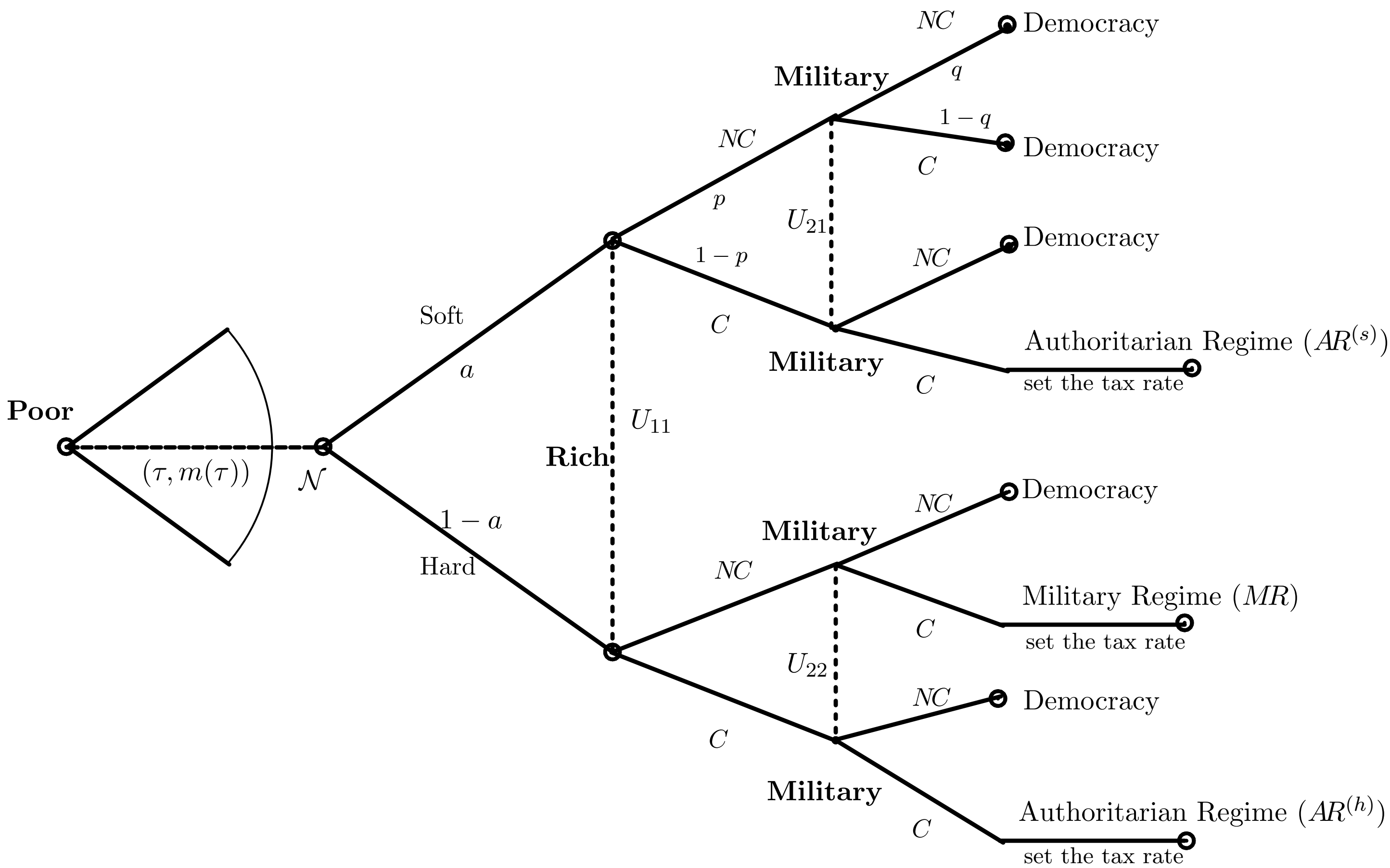
4 Concluding Remarks

Especially in a country right after democratization, the military plays an important role either in consolidating democracy or in mounting a coup against democracy. We demonstrate that in equilibrium, the poor (the government) have to redistribute a large military rent to the military to preclude a coup.

More importantly, in particular, our model describes the policy (redistributive policy) options available to a democratic government when it attempts to preclude a regime change. As long as the government can safeguard the institutional interests of the military, democracy will be sustained irrespective of the preferences of the rich, because the rich lack the power to overturn the existing regime single-handedly.

Evidently, as pointed out by Collier and Hoeffler (2006), in most of African countries, the military becomes both a defender of the government against external threats and internal rebellions, and itself a source of threat. Thus this threat against the government can become the predominant role: the military becomes a protection racket with the government buying security against a high level of coup risk by increasing military spending. As a consequence, it achieves a significant reduction. This is consistent with our conclusion.

Appendix 1



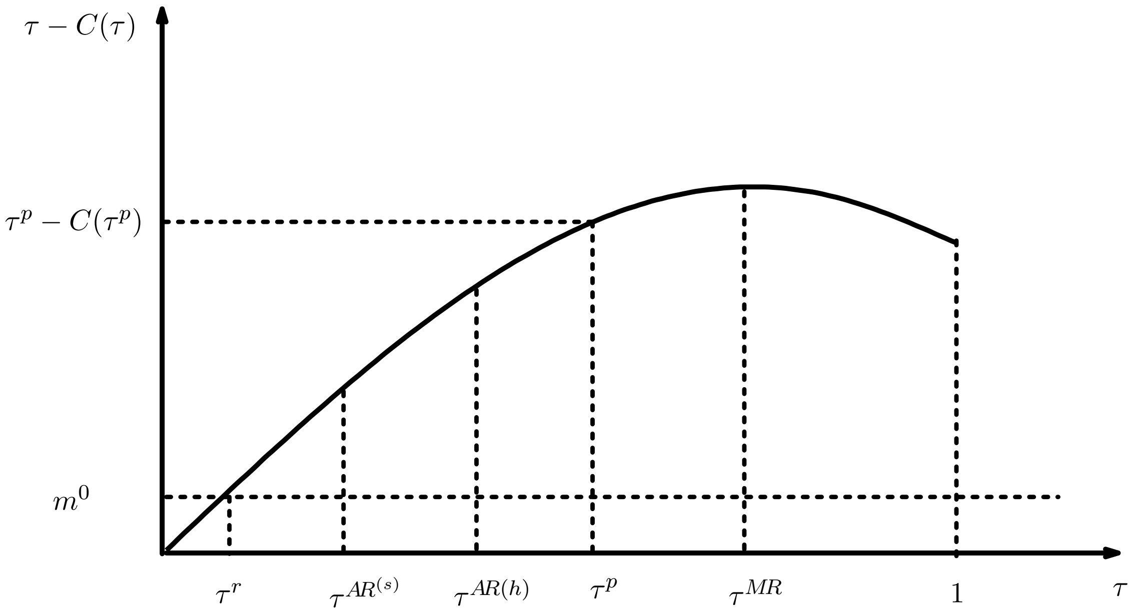
where

D: tax rate is set by the government (the poor).

$AR^{(i)}$: tax rate is set by negotiations between the rich and the military, $i = \{s, h\}$.

MR: tax rate is set by the military.

Figure 1: The Game Tree for the Coup game.



where

τ^r: the most preferred tax rate by the rich.

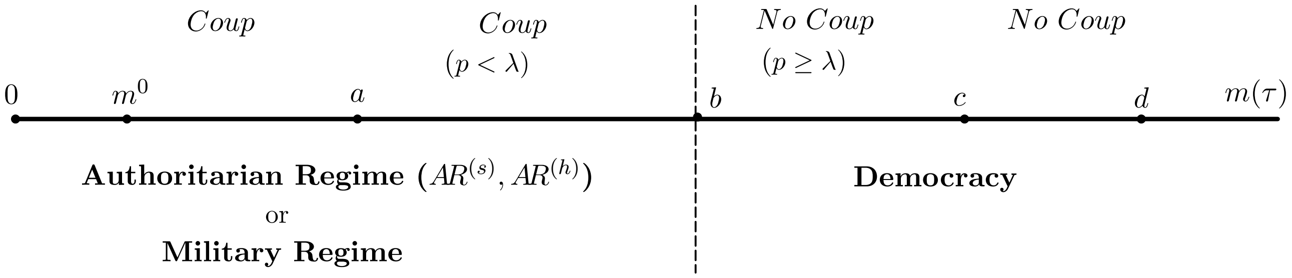
$\tau^{AR(s)}$: the tax rate under authoritarian regime, where the rich have the same bargaining power as the military.

$\tau^{AR(h)}$: the tax rate under authoritarian regime, where the military has a larger bargaining power than the rich.

τ^p: the most preferred tax rate by the poor under democracy.

τ^{MR}: the most preferred tax rate by the military under military regime.

Figure 2: Tax rates under different political regimes.



where

$a : (1 - \psi^H)(\tau^{MR} - C(\tau^{MR}))$.

$b : (1 - \psi^L)(\tau^{AR^{(s)}} - C(\tau^{AR^{(s)}}))$.

$c : (1 - \psi^L)(\tau^{AR^{(h)}} - C(\tau^{AR^{(h)}}))$.

$d : \tau^{MR} - C(\tau^{MR})$.

Figure 3: The strategies of the military in the coup game, according to the redistributive policy.

Appendix 2

Proof. Let the rich play *NC* and *C* with probability p and $1-p$, respectively. Thus the military's beliefs on which the rich play *NC* and *C* in the information set U_{21} and U_{22} are p and $1-p$.

In U_{21}, since their expected payoff from *NC* is $pV^m(D|\tau, m(\tau)) + (1-p)V^m(D|\tau, m(\tau))$, and their expected payoff from C is $pV^m(D|\tau, m(\tau)) + (1-p)V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, thus if $V^m(D|\tau, m(\tau)) > V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, the military will choose *NC*; if $V^m(D|\tau, m(\tau)) < V^m(AR^{(s)}|\ \tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, the military will choose C and if $V^m(D|\tau, m(\tau)) = V^m(AR^{(s)}|\ \tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, the military will play optional strategy.

Similarly, in U_{22}, since the expected payoff from *NC* is $pV^m(D|\tau, m(\tau)) + (1-p)V^m(D|\tau, m(\tau))$, and the expected payoff from C is $pV^m(MR|\tau^{MR}, m(\tau^{MR})) + (1-p)V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$, we can obtain the critical value, Λ, such that:

$$\Lambda = \frac{V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) - V^m(D|\tau, m(\tau))}{V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}})) - V^m(MR|\tau^{MR}, m(\tau^{MR}))}. \tag{18}$$

If $p > \Lambda$, the military will choose *NC*. In contrast, if $p < \Lambda$, the military will choose C.

For the military is the key player, the poor will redistribute the tax rate and military rent to prevent the military from initiating C. What are the military's strategies for different redistributive tax rate ? We show the details as follows:

1. If the poor make a redistribution which satisfies $V^m(D|\tau, m(\tau)) \geq V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$, i.e., $m(\tau) \geq (1-\psi^L)(\tau^{AR^{(h)}} - C(\tau^{AR^{(h)}}))$, to the military, *hard* type has a larger payoff from playing *NC* than playing C. By (16), we know that *soft* type also chooses *NC*. The rich have a same expected payoff from playing either *NC* or C. Thus there is an equilibrium: the poor redistribute $(\tau, m(\tau))$; the rich choose no coup with probability p, coup with probability $1-p$ for any $p \in (0,1)$; the military of both types chooses *NC*, where $m(\tau) = \tau - C(\tau)$.

2. If the poor redistribute military rent which satisfies $V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) < V^m(D|\ \tau, m(\tau)) < V^m(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$, i.e., $(1-\psi^L)(\tau^{AR^{(s)}} - C(\tau^{AR^{(s)}})) < m(\tau) < (1-\psi^L)(\tau^{AR^{(h)}} - C(\tau^{AR^{(h)}}))$,

- If $p > \Lambda$, the military of both types will choose *NC*. For the rich, the expected payoff from playing *NC*, $aV^r(D|\tau, m(\tau)) + (1-a)V^r(D|\tau, m(\tau))$, is equivalent to the expected payoff from playing C, $aV^r(D|\tau, m(\tau)) + (1-a)V^r(D|\tau, m(\tau))$. There is a Bayesian equilibrium: the poor redistribute $(\tau, m(\tau))$; the rich play *NC* with probability p, C with probability $1-p$; the military of both types plays *NC*, where $m(\tau) = \tau - C(\tau)$ and $p > \Lambda \in (0, 1)$.
- If $p = \Lambda$, the military of *hard* type plays a local strategy and *soft* type plays *NC*. For the rich, the expected payoff from playing *NC*, $aV^r(D|\tau, m(\tau)) + (1-a)[qV^r(D|\tau, m(\tau)) + (1-q)V^r(MR|\tau^{MR}, m(\tau^{MR}))]$, is equivalent to the expected payoff from playing C, $aV^r(D|\tau, m(\tau)) + (1-a)[qV^r(D|\tau, m(\tau)) + (1-q)V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))]$ for $q = 1$. Thus there is an equilibrium.
- If $p < \Lambda$, the military of *hard* type plays C and *soft* type plays *NC*. For the rich, the expected payoff from playing *NC*, $aV^r(D|\tau,\ m(\tau)) + (1-a)V^r(MR|\tau^{MR}, m(\tau^{MR}))$, is not equivalent to the expected payoff from playing C, $aV^r(D|\tau, m(\tau)) + (1-a)V^r(AR^{(h)}|\ \tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$. Thus there is no equilibrium.

3. If the poor redistribute military rent which satisfies $V^m(D|\tau, m(\tau)) = V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, i.e., $m(\tau) = (1-\psi^L)(\tau^{AR^{(s)}} - C(\tau^{AR^{(s)}}))$, the military of *soft* type will choose an optimal strategy:

   - If $p > \Lambda$, the military of *hard* type will choose *NC*. For the rich, the expected payoff from playing *NC*, $a[qV^r(D|\tau, m(\tau)) + (1-q)(1-a)V^r(D|\tau, m(\tau))] + (1-a)V^r(D|\tau, m(\tau))$, is equivalent to the expected payoff from playing C, $a[qV^r(D|\tau, m(\tau)) + (1-q)(1-a)V^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))] + (1-a)V^r(D|\tau, m(\tau))$ for $q = 1$. Thus there is an equilibrium.
   - If $p = \Lambda$, the military of *hard* type will play an optimal strategy. For the rich, the expected payoff from playing *NC*, $a[qV^r(D|\tau, m(\tau)) + (1-q)V^r(D|\tau, m(\tau))] + (1-a)[qV^r(D|\tau, m(\tau)) + (1-q)V^r(MR|\tau^{MR},\ m(\tau^{MR}))]$, is equivalent to the expected payoff from playing C, $a[qV^r(D|\tau, m(\tau)) + (1-q)V^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))] + (1-a)[qV^r(D|\ \tau, m(\tau)) + (1-q)V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))]$ for $q = 1$. Thus there is an equilibrium.

- If $p < \Lambda$, the military of *hard* type plays C. For the rich, the expected payoff from playing NC, $a[qV^r(D|\tau, m(\tau)) + (1-q)V^r(D|\tau, m(\tau))] + (1-a)V^r(MR|\tau^{MR}, m(\tau^{MR}))$, is not equivalent to the expected payoff from playing C, $a[qV^r(D|\tau, m(\tau)) + (1-q)V^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))] + (1-a)V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$ for any q. Thus there is no equilibrium.

4. If the poor redistribute military rent which satisfies $V^m(MR|\tau^{MR}, m(\tau^{MR})) < V^m(D|\tau, m(\tau)) < V^m(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}}))$, i.e., $(1-\psi^H)(\tau^{MR} - C(\tau^{MR})) < m(\tau) < (1-\psi^L)(\tau^{AR^{(s)}} - C(\tau^{AR^{(s)}}))$, the military of *soft* type play C:

    - If $p > \Lambda$, the military of *hard* type will choose NC. For the rich, the expected payoff from playing NC, $aV^r(D|\tau, m(\tau)) + (1-a)V^r(D|\tau, m(\tau))$, is not equivalent to the expected payoff from playing C, $aV^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) + (1-a)V^r(D|\tau, m(\tau))$. There is no equilibrium.
    - If $p = \Lambda$, the military of *hard* type plays a local strategy. For the rich, the expected payoff from playing NC, $aV^r(D|\tau, m(\tau)) + (1-a)[qV^r(D|\tau, m(\tau)) + (1-q)V^r(MR|\tau^{MR}, m(\tau^{MR}))]$, is not equivalent to the expected payoff from playing C, $aV^r(D|\tau, m(\tau)) + (1-a)[qV^r(D|\tau, m(\tau)) + (1-q)V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))]$ for any q. Thus there is no equilibrium.
    - If $p < \Lambda$, the military of *hard* type plays C. For the rich, the expected payoff from playing NC, $aV^r(D|\tau, m(\tau)) + (1-a)V^r(MR|\tau^{MR}, m(\tau^{MR}))$, is not equivalent to the expected payoff from playing C, $aV^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(h)}})) + (1-a)V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$. Thus there is no equilibrium.

5. If the poor redistribute military rent which satisfies $V^m(D|\tau, m(\tau)) \leq V^m(MR|\tau^{MR}, m(\tau^{MR}))$, i.e., $m(\tau) \leq (1-\psi^H)(\tau^{MR} - C(\tau^{MR}))$, by (14), the military of both types plays C. For the rich, the expected payoff from playing NC, $aV^r(D|\tau, m(\tau)) + (1-a)V^r(MR|\tau^{MR}, m(\tau^{MR}))$, is not equivalent to the expected payoff from playing C, $aV^r(AR^{(s)}|\tau^{AR^{(s)}}, m(\tau^{AR^{(s)}})) + (1-a)V^r(AR^{(h)}|\tau^{AR^{(h)}}, m(\tau^{AR^{(h)}}))$. Thus there is no equilibrium.

□

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